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Starting and Charging System

I、Summary

(I) Structure outline

Starting system mainly includes battery, ignition switch, starter, starter relay and related lines.

Main components of charging system include: generator assembly (inbuilt voltage regulator), battery, battery charging indicator light.

Starting System

As main component of starting system, starter consists of direct current motor, electromagnetic switch and transmission mechanism. Direct current motor lead in current from battery and make driving gear wheel to turn; transmission mechanism makes driving gear wheel mesh into flywheel gear ring, and also can automatically disconnect after engine starting; starter circuit is controlled by electromagnetic switch.

Starting system has 2 separate circuits: one is to provide high current to starter, the other is low current control circuit which controls starter relay.

Charging System

Main function of generator is to provide power to all electrical equipment (except starter) when engine running normally, and also charge battery. Generator mainly consists of 5 parts: rotor, stator, voltage regulator, end cover. The rotor and stator generate alternating current with electromagnetic cutting principle, generated alternating current is transformed into 14V stabled direct current by rectification and voltage stabilization of voltage regulator. Generator is driven by engine through engine belt and pulley device.

Battery

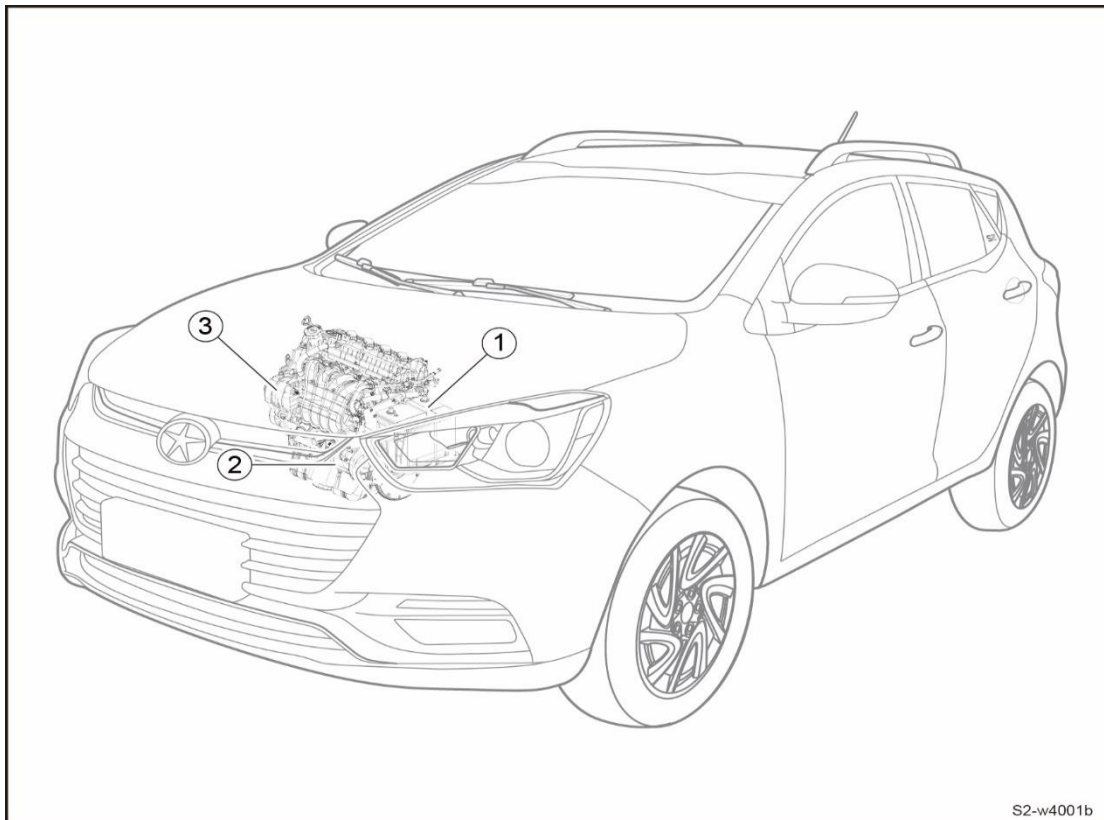
The vehicle uses free-maintenance battery, whose difference with traditional battery is there is no vent plug on battery cover, and battery is completely sealed except small vent holes on both sides of battery. Small quantity of gas produced by battery can be released from vent holes, small amount of gas will be released when electrolyte inside battery has chemical reactions, and if there is no exhaust vent, internal pressure will increase continuously along with air increase, and battery shell will crack down when pressure exceeds its limitation.

Compared to regular battery, free-maintenance battery has following advantages:

- No need to add water during battery service life.
- Overcharge protection.
- Power leakage is not as easy as regular battery.
- Smaller weight and volume, large capacity.

Battery has 3 main functions in whole electrical system:

- Supply starting power when engine starting.
- Work as electrical system voltage stabilizer.
- When generating capacity of generator can't satisfy need of electrical system, battery can supply power in a certain period of time.

Component Position

1. Battery 2. Starter 3. Generator

(II) Operating Principle

Operating principle of starter: Turn ignition switch to “START” → Contact plate connects electromagnetic switch bolt (at the same time shifting fork knockout gear wheel and mesh with flywheel) → Battery positive electrode (+) supplies power, main current flows into commutator from positive electrode brush → Rotor rotates under the action of magnetic field → (Drive planet wheel to turn) → small gear wheel move forward along drive shaft spline → Gear drive flywheel to turn → engine starts to work.

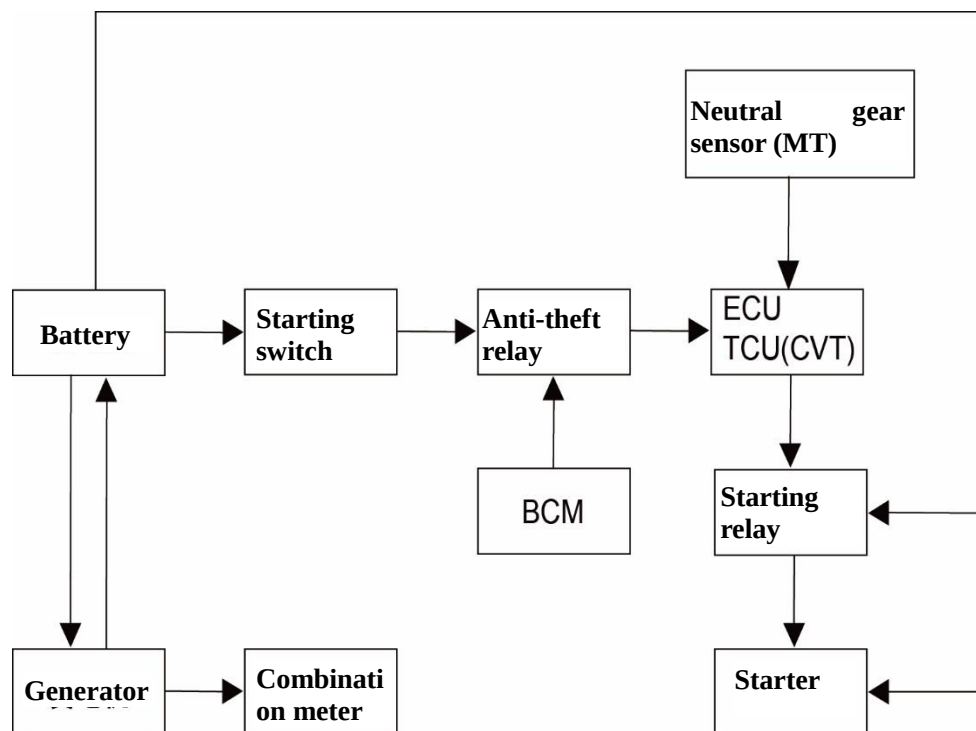
Operating principle of generator: Generator provides direct current voltage power to vehicle electrical system and keep battery in charging state. Output of voltage is controlled by voltage regulator. When turn ignition switch to “START”, current flows into excitation coil, which is initially motivated. When stator coil starts generating electricity after engine starting, excitation coil is activated by output current from stator coil. Terminal “B” supplies power to vehicle electrical system, and supply charge power to battery. Voltage regulator checks input voltage at “S” terminal, and controls output voltage accordingly. If excitation current increases, output power of alternating current generator increases, otherwise it decreases. When battery voltage (voltage of “S” terminal of alternating current generator) reaches about 14.4V regulating voltage, excitation current is cut off. When battery voltage drops below regulating voltage, voltage regulator regulates output voltage by controlling excitation current to maintain it in constant level.

When ignition switch is turned on and engine not start, power supply connect to terminal of combination meter charging indicator light through indoor electrical box, to combination meter terminal, through “L” terminal of generator to “E” terminal to grounding joint, at the same time charging indicator light will be on.

After starting engine, when generator can work normally, voltage of power supply terminal of charging indicator light is close to “L” terminal of engine, charging indicator light is off. If charging indicator light is still on

when engine running, it indicates there is fault. If there is no voltage or too high voltage when engine working, indicating function of voltage regulator will start, and charging indicator light will be on.

Electrical Schematic Diagram



(III) Technical Parameter

Battery Specification

No.	Application	Description
1	Cool starting current	433A (SAE)
2	20 hours rate capacity	55Ah
3	Rated voltage	12V

Starter Specification

No.	Application	Description
1	Voltage	12V
2	Power	1.2KW

Generator Specification

No.	Application	Description
1	Current	90A
2	Voltage	14V

(IV) Torque Parameter

No.	Tighten part name	Torque (N·m)
1	Generator regulating nut	20~25

2	Generator square-head bolt tighten nut	42~52
3	Battery pressing plate fixed nut	5~8
4	Generator power supply wiring harness fixed nut	10~14

(V) Maintenance Caution

Before maintaining any electrical component, ignition switch should be in “OFF”, and all electrical load must be “OFF”, unless there is other description in operating procedure. If tool or device is easy to contact with exposed energized electrical terminals, battery negative electrode should be disconnected. Violation of these security notice could lead to personal injury or vehicle component damage.

1. Start with auxiliary battery

1). If need to use auxiliary and cross-wiring to start engine, please ensure to use 12V auxiliary battery. After connecting battery cross-wiring, ensure cross-wiring is clamped to battery terminal and in good connection.

2. Method to prevent battery over-charging

1). Should always keep battery surface (especially top) clean and dry, connecting part of terminal should be clean and tightened; if not use vehicle for a long period, battery negative electrode should be disconnected, and check battery charging state periodically.

II、Troubleshooting

(I) Troubleshooting List

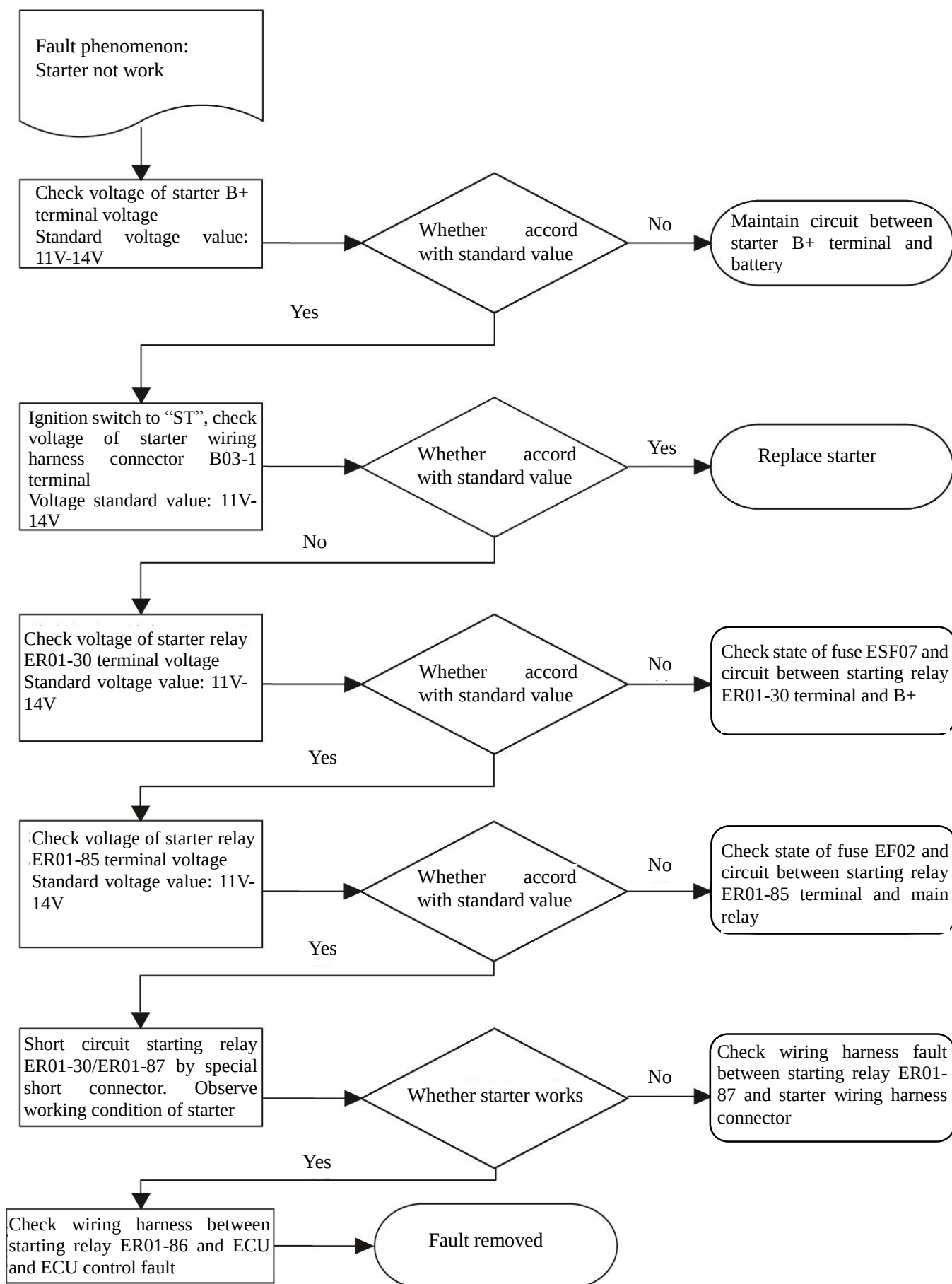
1. Check whether there is after-sales installation which will affect starting, charging or ignition system.
2. Check system components those are easy to be seen or contacted to check whether there is obvious damage or easy to cause damage.
3. Check whether battery is installed correctly.
4. Test condition of battery, whose voltage should not be less than 11.5V.
5. Check whether there is damage on relevant wire, and check whether connections of starter motor, starter electromagnetic switch, starting switch, battery and all relevant ground are reliable.
6. Check whether installation of generator is loosen or improperly installed, and whether driving belt tension is normal or there is possibility for slip.

No.	Fault phenomenon	Fault reason analysis	Solution	Remark
1	Starting abnormal	Engine ignition, fuel system fault	Check engine ignition, fuel system	Refer to “Starter not work”
		Starter power supply fault	Check starter power supply	
		Starter fault	Replace starter	
		Starter electromagnetic switch fault	Replace starter electromagnetic switch	
		Engine mechanical binding	Check related machinery components of engine	
		Starter electromagnetic switch power supply circuit fault	Check related circuit	
		Starter ground wire fault	Check ground circuit	
		Starter control power supply circuit fault	Check related circuit	
		Starting relay fault	Replace starting relay	
		Anti-theft control system fault	Maintain anti-theft control system	

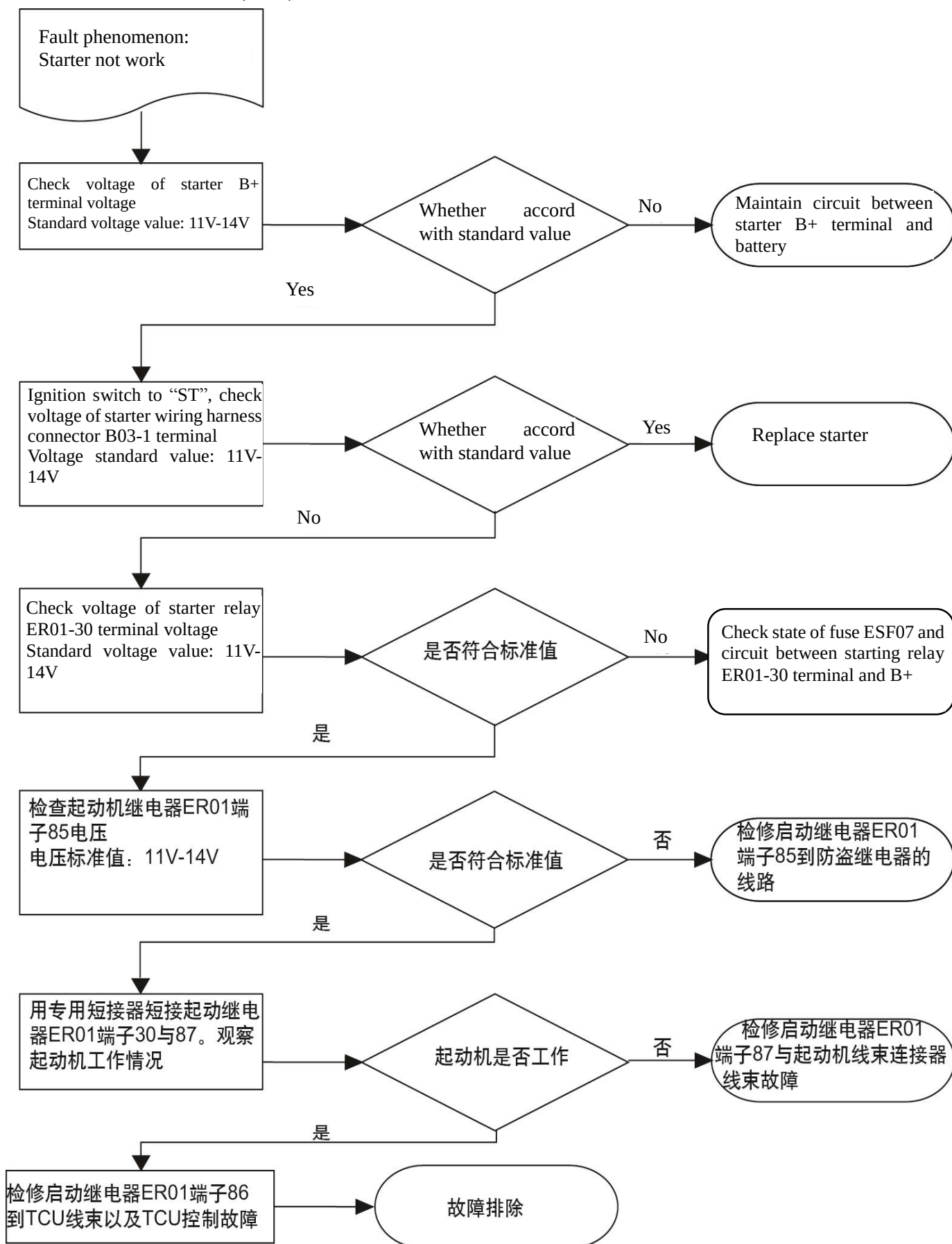
		Starting switch fault	Replace starting switch	
2	Starter can't stop working	Starting relay fault	Replace starting relay	
		Starter fault	Replace starter	
		Starter switch fault	Replace starting switch	
3	Starter noise	Flywheel gear ring damage (Gear crack, missing or abrasion etc.)	Replace flywheel	
		Flywheel damage (flywheel deformation)	Replace flywheel	
		Starter fault (gear crack or abrasion, axle sleeve abrasion)	Replace starter	
4	Charging indicator light always on	Generator L terminal circuit fault	Check related circuit	
		Ground wire of combination meter power supply fault	Check related circuit or replace combination meter	
		Generator power supply circuit fault	Check related circuit	
		Generator fault	Replace generator	
5	Charging indicator light not on	Generator L terminal circuit fault	Check related circuit	
		Generator fault	Replace generator	
		Ground wire of combination meter power supply fault	Check related circuit or replace combination meter	
6	Generator noise	Generator fault	Replace generator	
		Generator installation fault	Install generator again	
		Generator belt fault	Install again or replace	

(II) Troubleshooting Flow Chart

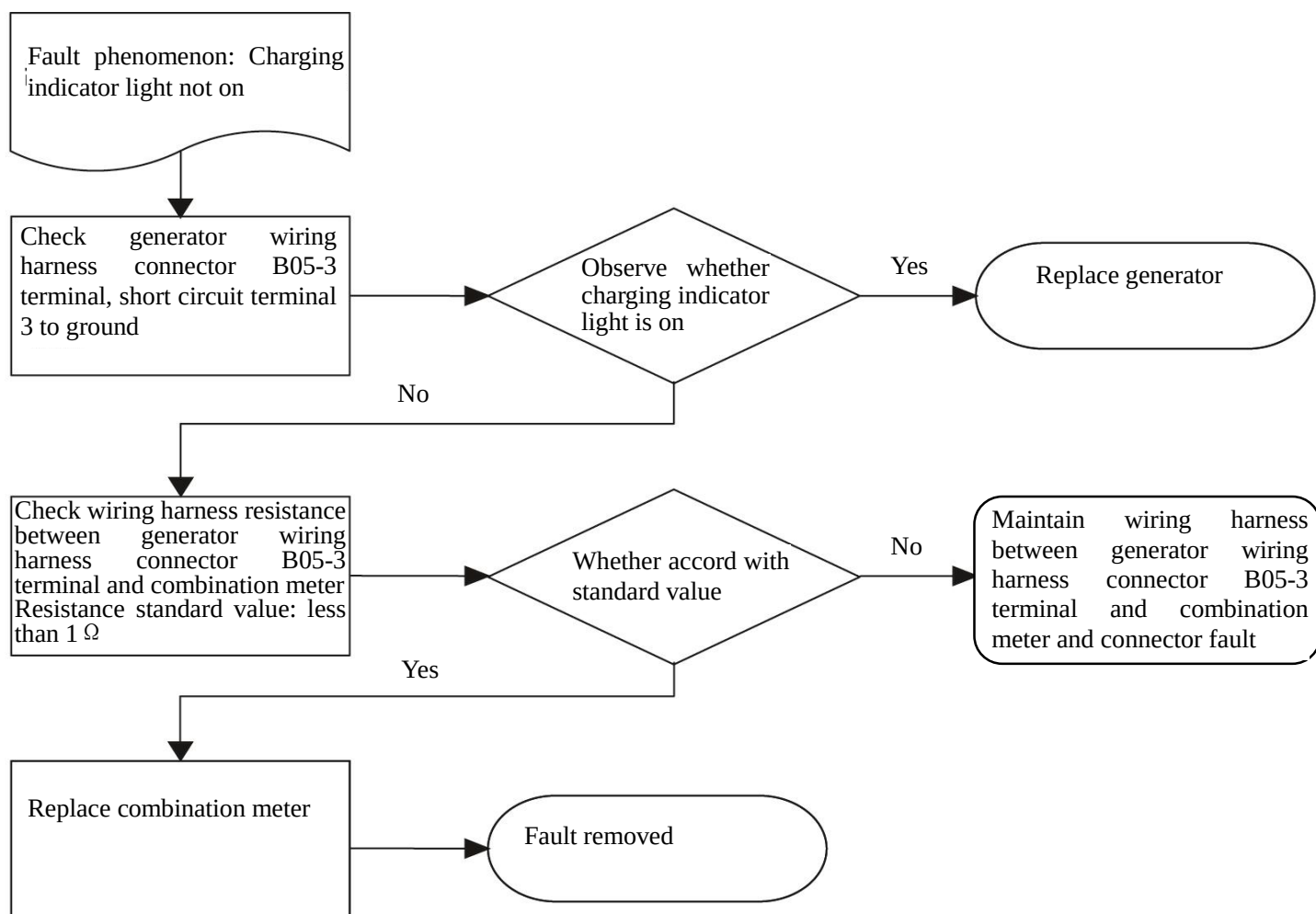
Starter not work (MT)



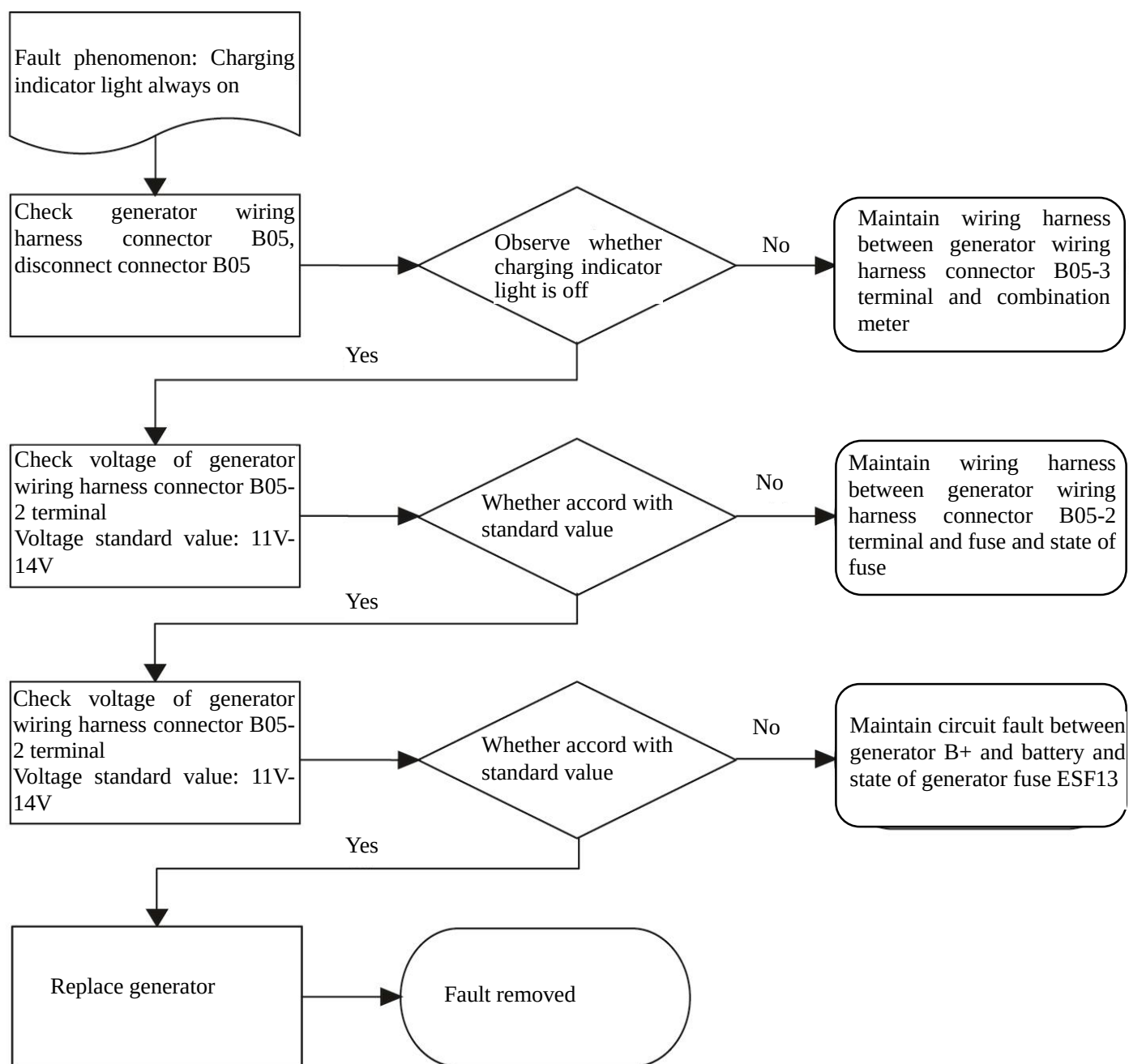
Starter not work (CVT)



Generator Charging Indicator Light not ON



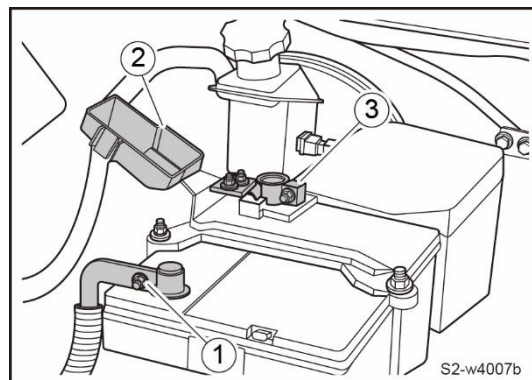
Generator Charging Indicator Light Always On



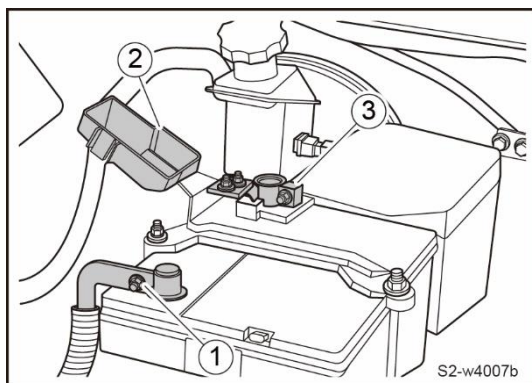
III、Disconnection and Connection of Battery Electrode

(I) Disconnection

1. Open engine cabin cover
2. Disconnect negative electrode of battery
 - 1). Ensure ignition switch to be in “OFF”;
 - 2). Loosen negative electrode nut ① of battery, and take down negative electrode of battery;

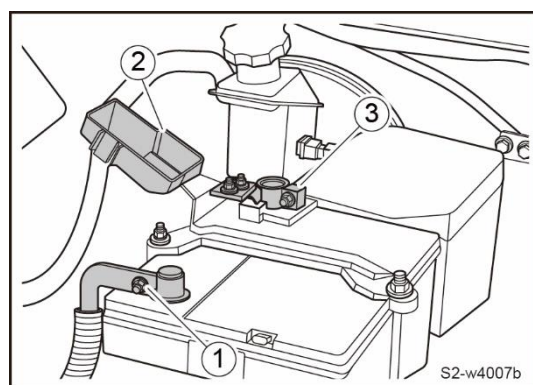


3. Disconnect positive electrode of battery
 - 1). Open electrode protection cover ②, loosen positive electrode nut ③ of battery, and take down positive electrode of battery;



(II) Connection

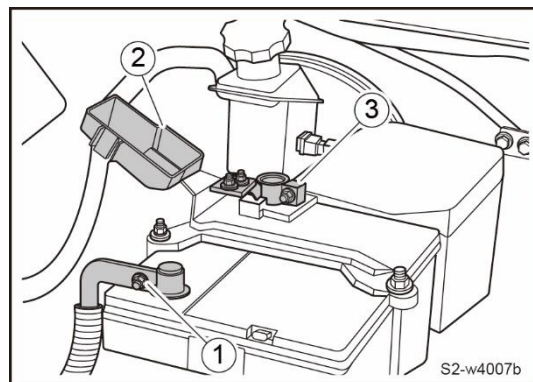
1. Connect positive electrode of battery
 - 1). Ensure ignition switch to be in “OFF”;
 - 2). Install positive electrode of battery, tighten nut ③, and close positive protection cover



②;

Tighten torque 5~8N m

2. Connect negative electrode of battery
 - 1). Install negative electrode ① of battery, tighten fixe nut of negative electrode;
Tighten torque 5~8N m

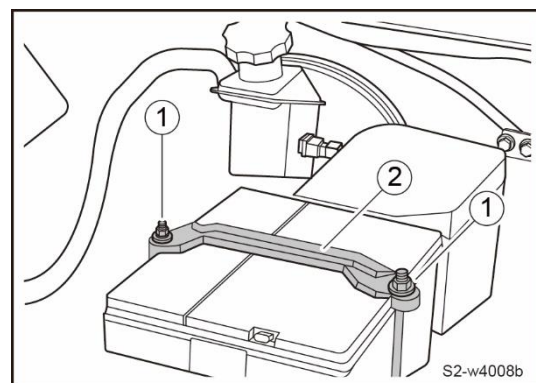


3. Close engine cabin cover.

IV、Press plate of Battery

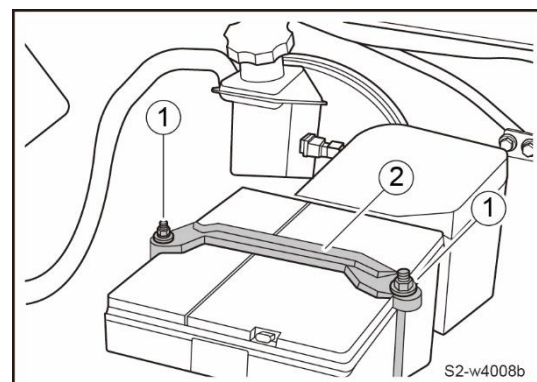
(I) Removal

1. Open engine cabin cover
2. Disconnect negative electrode of battery; refer to “Disconnection and connection of battery electrode”;
3. Remove press plate of battery;
 - 1). Remove battery press rod nut ①, and take down press rod of battery and press plate of battery②;



(II) Installation

1. Install press plate of battery;
 - 1). Install battery press rod and battery press plate ②, tighten battery press plate nut ①;
Tighten torque 5~8N m

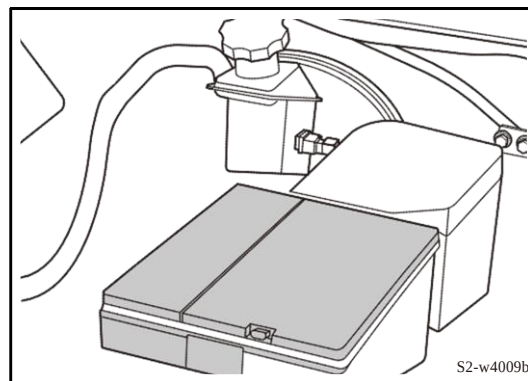


2. Connect negative electrode of battery;
3. Close engine cabin cover;

V、Battery Assembly

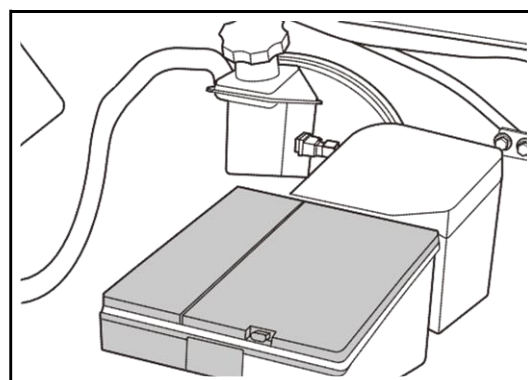
(I) Removal

1. Open engine cabin cover;
2. Disconnect negative electrode of battery; refer to “Disconnection and connection of battery electrode”;
3. Disconnect positive electrode of battery; refer to “Disconnection and connection of battery electrode”;
4. Remove battery press plate; refer to “Removal of press plate of battery”;
5. Remove battery assembly;
 - 1). Take down battery assembly;



(II) Installation

1. Install battery assembly;
 - 1). Place battery assembly to battery pallet;



2. Install press plate of battery;
3. Connect positive electrode of battery;
4. Connect negative electrode of battery;
5. Close engine cabin cover;

(III) Inspection

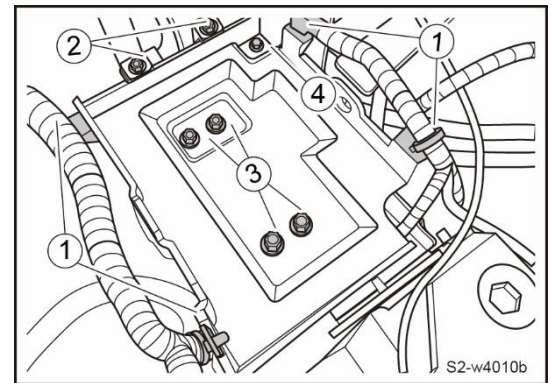
1. Visually inspection
 - 1). Check whether electrode is damaged; replace any damaged or electrode clamp deformed battery electrode;
 - 2). Check whether battery baseplate and battery press plate or press rod are damaged; replace any damaged parts;
 - 3). Check whether battery casing there is crack or other damage causing electrolyte leaking;
 - 4). Check whether battery electrode is loose; replace any damaged parts;
 - 5). Check test indicator observed hole (if equipped) inside battery, whether display battery condition. If battery already discharged, please charge.
2. Voltage inspection

- 1). $U > 13.2V$, please check electrical system;
- 2). $12.5V < U < 12.9V$, system is normal;
- 3). $11V < U < 12.4V$, please check charging system;
- 4). $U < 11V$, indicates that battery is damaged or charging system fault, please check charging system and battery.

VI、Battery Pallet

(I) Removal

1. Open engine cabin cover;
 2. Disconnect battery negative electrode; refer to “Disconnection and connection of battery negative electrode”;
 3. Disconnect battery positive electrode; refer to “Disconnection and connection of battery electrode”;
 4. Remove battery press plate; refer to “battery press plate”;
 5. Remove battery assembly; refer to “battery assembly”;
 6. Remove battery pallet;
- 1). Disconnect 4 buckles ① connected battery pallet and pipe wiring harness;
 - 2). Remove 2 connected bolts ② of battery pallet and lower bracket of junction box;
 - 3). Remove 4 bolts ③ of battery pallet and lower bracket hole of pallet;
 - 4). Remove fixed bolt ④ of battery pallet and vehicle body;
 - 5). Take down battery pallet assembly;

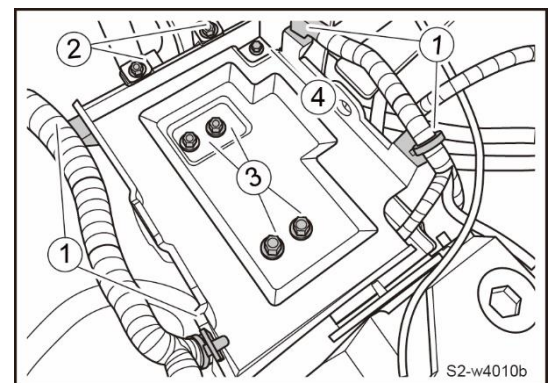


(II) Inspection

1. Check battery pallet;
- 1). Check whether battery pallet corroded. If any, please clean with clean hot water.

(III) Installation

1. Install battery pallet;
- 1). Align battery pallet to installation hole of pallet lower bracket; pre-tighten fixed bolt ④ connected battery pallet and vehicle body; Tighten torque 5~8N m
- 2). Tighten 4 fixed bolts ③ connected battery pallet and pallet lower bracket; Tighten torque 12~15N m
- 3). Tighten 2 bolts ② connected battery pallet and lower bracket of junction box; Tighten torque 5~8N m
- 4). Connect 4 buckles ① connected battery pallet and pipe wiring harness;



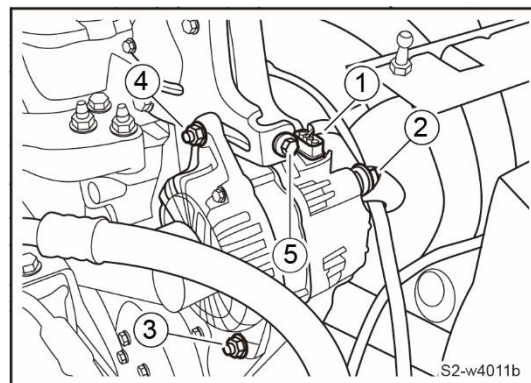
2. Install battery assembly;
3. Install battery press plate;
4. Connect battery positive electrode;
5. Connect battery negative electrode;
6. Close engine cabin cover;

VII、Generator

(I) Removal

1. Open engine cabin cover;
2. Disconnect battery negative electrode; refer to “Disconnection and connection of battery electrode”;
3. Remove engine intake hose; refer to “intake hose assembly”;
4. Remove air filter assembly; refer to “Air filter assembly”;
5. Remove electronic throttle valve; refer to “Electronic throttle valve”;
6. Remove intake manifold, refer to “intake manifold”;
7. Remove generator belt;
8. Remove generator

- 1). Disconnect generator wiring harness connector ①;
- 2). Remove fixed bolts ② of generator (power supply) wiring harness connector
- 3). Remove lower nut ③ of generator, and take down square-head

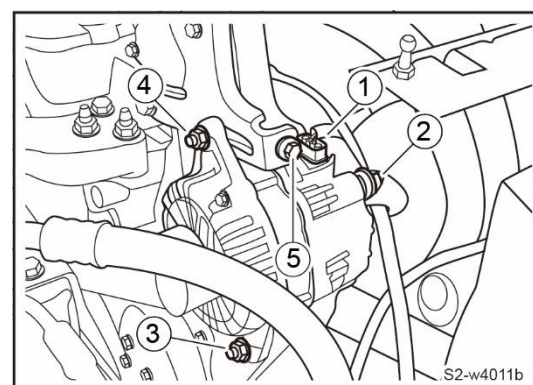


nut;

- 4). Remove generator regulating nut ④;
- 5). Rotate generator regulating nut ⑤ anticlockwise, and take down movable pin;
- 6). Take down generator;

(II) Installation

1. Install generator;
 - 1). Place generator to installation position;
 - 2). Install movable pin, tighten generator regulating nut ④;
Tighten torque 20~25N m
 - 3). Tighten generator regulating bot ⑤;
 - 4). Install square-head bolt, and tighten fixed nut ③;
Tighten torque 42~52N m
 - 5). Install connected bolt ② of generator (power supply);
Tighten torque 10~14N m
 - 6). Connect engine wiring harness connector ①;



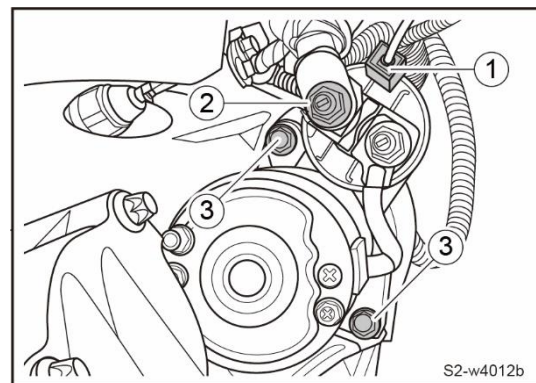
2. Install generator belt;
3. Install intake manifold;
4. Install electronic throttle valve;
5. Install air filter assembly;
6. Install engine intake hose;
7. Connect battery negative electrode;
8. Close engine cabin cover;

VIII、Starter

(I) Removal

1. Open engine cabin cover;
2. Disconnect battery negative electrode;
3. Remove engine intake hose; refer to “Intake hose assembly”;
4. Remove air filter assembly; refer to “Air filter assembly”;
5. Remove electronic throttle valve; refer to “Electronic throttle valve”;
6. Remove intake manifold; refer to “Intake manifold”;
7. Remove starter

- 1). Disconnect starter wiring harness connector①;
- 2). Remove fixed nut ② of starter (power supply) wiring harness



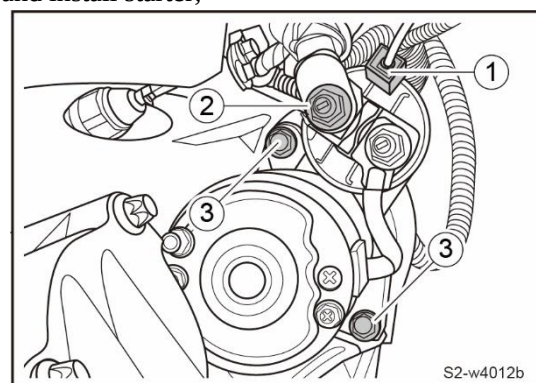
connector;

- 3). Remove 2 fixed bolts ③ in upper and lower part of starter, and take down starter;

(II) Installation

1. Install starter

- 1). Tighten 2 fixed bolts ③ in upper and lower part of starter, and install starter;
- 2). Install fixed nut ② of started (power supply) wiring harness



connector;

- 3). Connect wiring harness connector ① of starter;

2. Install intake manifold;
3. Install electronic throttle valve;
4. Install air filter assembly;
5. Install engine intake hose;
6. Connect battery negative electrode;
7. Close engine cabin cover.

Air-conditioning Device

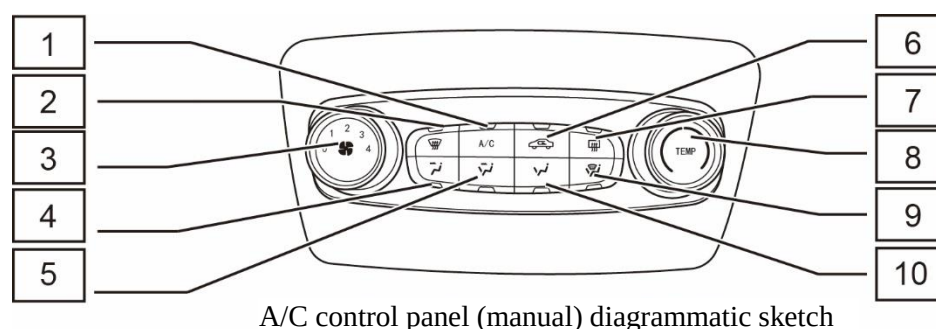
I、Summary

(I) System outline

The vehicle applies manual control A/C system. A/C condenser applies supercooled type, thus improving cooling performance. To enhance defrost performance, when choose mixing and defrost mode, it is manually switched to A/C mode. Based on the vehicle speed, cooling water temperature, and different pressure of air conditioning refrigerant, the condenser fan has two speed control modes - low and high speed control. The increase of the blower air volume and the improvement of the air mixing capability will improve cooling and heating performance.

Control Type and Performance Description of A/C Control Panel

A/C control applies manual control type, panel is integrated with rear defrost heating switch, panel illumination applies backlight/LED, button symbol applies spray-paint laser engrave; button and knob function of A/C panel are shown as picture below.



- | | |
|--------------------------------------|--|
| 1. A/C switch | 6. Intake internal and external circulation button |
| 2. Defrost and demist mode button | 7. Rear defrost button |
| 3. Blowing rate regulating button | 8. Temperature regulating button |
| 4. Blowing face mode button | 9. Blowing feet defrost mode button |
| 5. Blowing face and feet mode button | 10. Blowing feet mode button |

System Component

1. A/C host assembly

A/C host assembly consists of blower, expansion valve, evaporator, heater and casing. Blower intakes external air and gets into vehicle through evaporator and heater to realize A/C normal working.

2. Blower

Blower consists of motor and fan, using intake port air door motor to switch internal and external air circulation mode, and intake internal air and external air. Function of intake port air door motor is realized by internal and external air button of controller. When in internal circulation mode, intake from two intake port in the side; when in external circulation mode, intake through filter on front guard cover of vehicle, at the same time using blower inletting air, and carry out heat exchange through evaporator, refrigerated air getting into vehicle.

3. Speed regulating module

The system uses speed regulating resistance, totally divided 4 grade, not variable speed regulating.

4. Air door motor

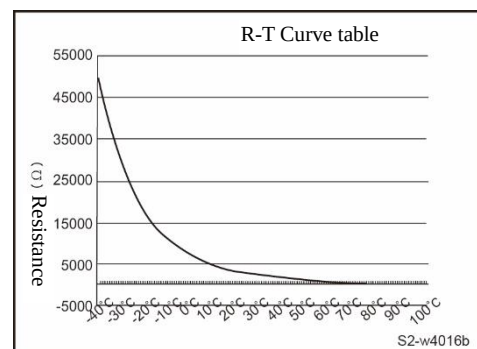
Installed in blower assembly, controlled by A/C internal and external circulation selection button, drive internal and external circulation air door to realize switch of air intake way.

5. Blower motor

Rotating fan forms A/C system required air quantity by vehicle power supply.

6. Evaporator temperature sensor

Detecting temperature of evaporator core, pass signal to controller to prevent evaporator from freezing. It is installed in evaporator core. Sensor has a negative temperature coefficient thermistor, thus resistance increase when temperature decreases, and resistance decreases when temperature rises.



7. Evaporator and heater

Air sent by blower goes through evaporator and gets cooled, some air through the evaporator will be sent to heater core, and the rest is supplied to upper portion of heater housing, according to opening and closing degree of temperature control damper. In order to control indoor temperature regulation and air mixing, air from heater core will be mixed with the air of the upper portion of the housing in the heater housing rear section. Controlled by the mode damper motor, the mixed air is sent to the required outlet so as to realize the vehicle interior temperature regulation and defrost / defog function. In short, the heater assembly adjusts air mixing, and controls temperature and wind direction.

8. Mode motor

Installed in the left part of the heater housing, controlled by signal of A/C panel (ETC) mode switch, it can start small motor inside air door motor to adjust the position of mode air door. When motor starts, changes in the voltage difference will be sent to ETC, and ETC will judge the feedback signal. When the air door moves to the required position, the motor will stop working.

9. Temperature motor assembly

Installed in the right part of heater housing, controlled by signal of A/C controller temperature knob, it can start small motor to regulate position of temperature controlled air door. When motor starts, changes in the voltage difference will be reflected to A/C controller, and A/C controller will judge the feedback signal. When air door moves to required position, motor will stop working.

10. Condenser and drier

High temperature & high pressure gas refrigerant from compressor will be cooled down at normal temperature. Cooling of the condenser relies on traveling wind and forced air volume of fan. This model uses a parallel flow condenser, combined with drying bottles together. Undercooling can improve cooling performance, reducing the amount of refrigerant system needs, and also reduce number of parts combining with drying bottles. When the system is contaminated, previously drying bottles would be replaced. But for this model, you can just remove the cap of the lower part of the drying bottle and replace the desiccant.

11. Engine cooling system

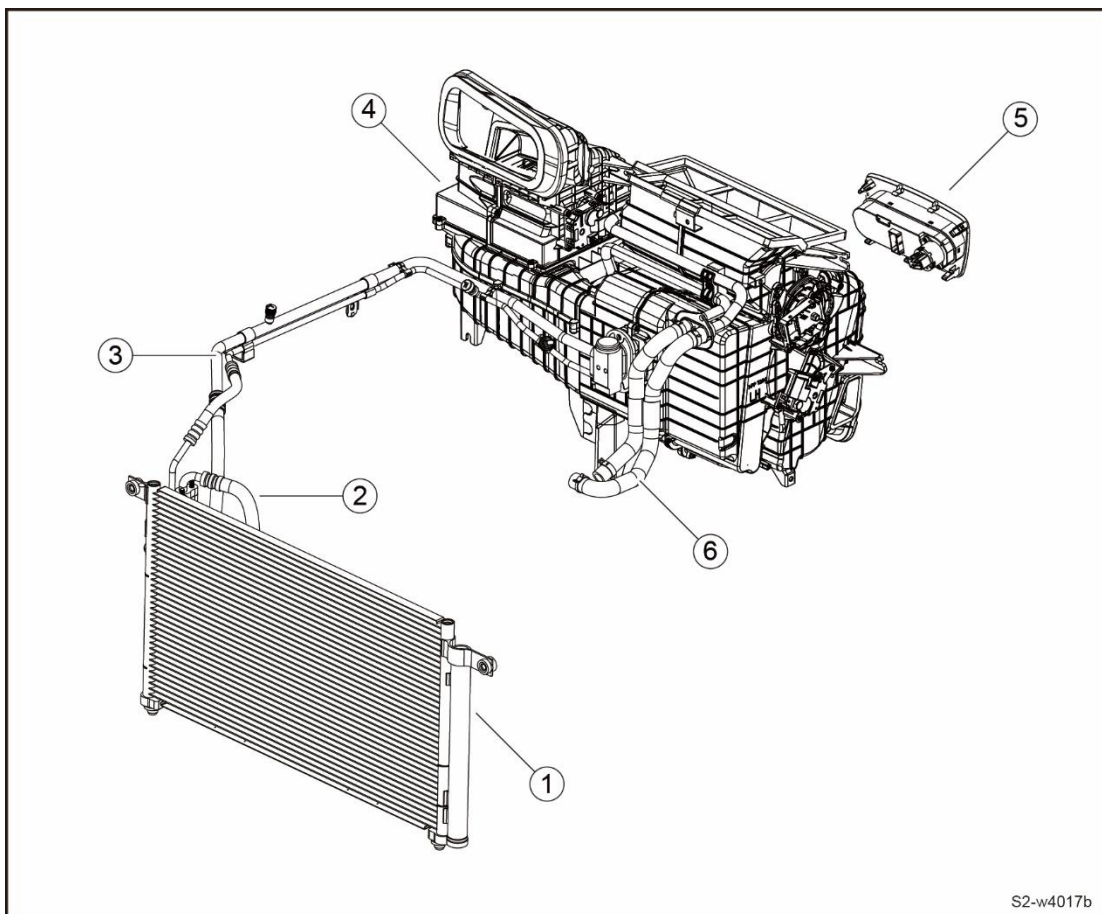
After comparing inputted vehicle speed, A/C load, coolant temperature value, engine ECU is divided into two parts (high/low) to control speed of cooling fan. When vehicle speed signal and coolant temperature sensor failure, driving cooling fan will be high speed running at the same time. Cooling fan is integrated in front module, switching to high/low speed through collecting coolant temperature, vehicle speed etc. related information.

Condenser fan equipped with 1.5 engine, when high speed, power is 180 ~ 220W; when low speed, power is 120 ~ 150W; Condenser fan equipped with 1.3 engine, when high speed, power is 140 ~ 150W; when low speed, power is 120 ~ 130W.

12. Ternary pressure switch

Ternary pressure switch is to increase the medium pressure switch to conventional A/C binary pressure switch. When the system pressure rises, the medium pressure switch is activated and sends signals to the engine control unit. At this moment, radiator fan and condenser fan keep high speed; it can prevent performance degradation caused by the pressure rises. Also, air conditioning systems will be protected when abnormal pressure (high/low pressure) occurs.

(II) Component Position

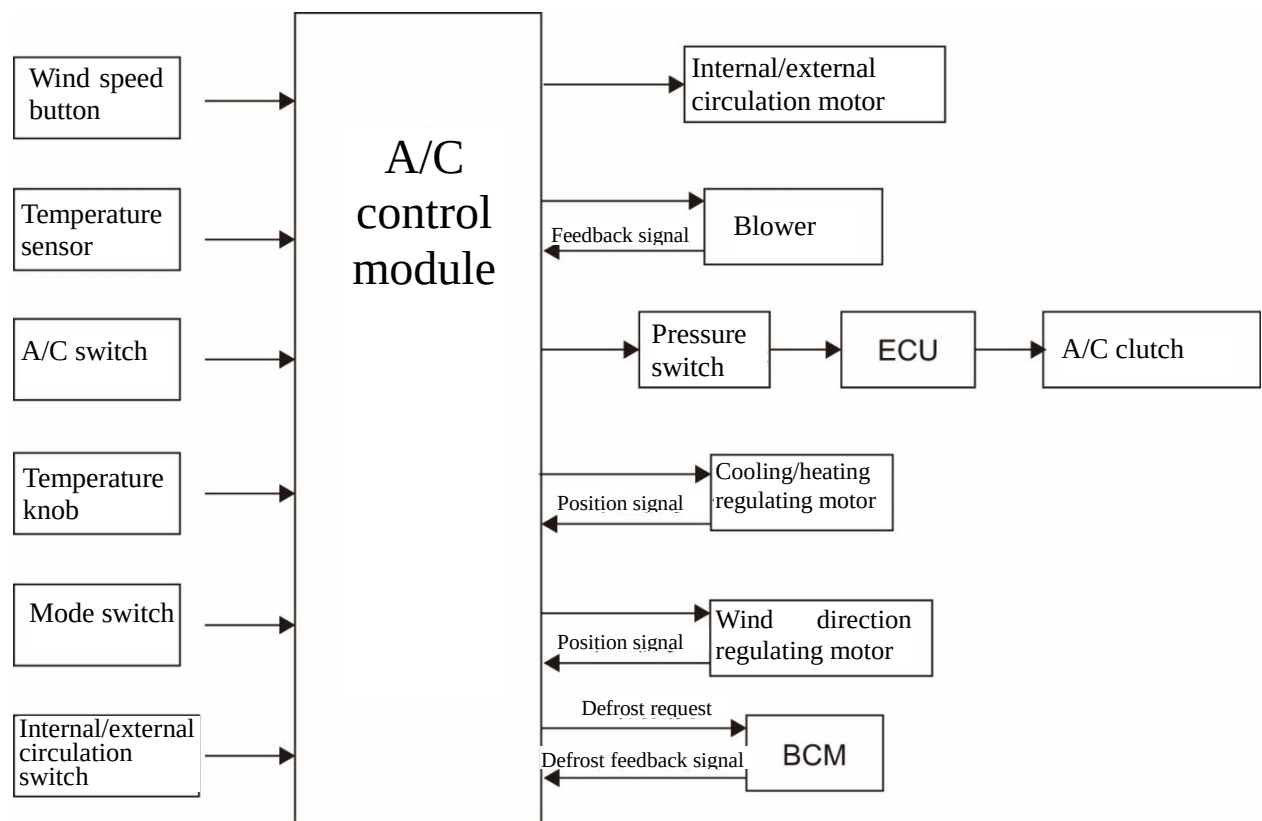


- 1. Condenser assembly
- 2. Exhaust pipe assembly
- 3. Pipe and expansion valve assembly

- 4. A/C host assembly
- 5. A/C controller assembly
- 6. Heating air inlet/outlet water pipe assembly

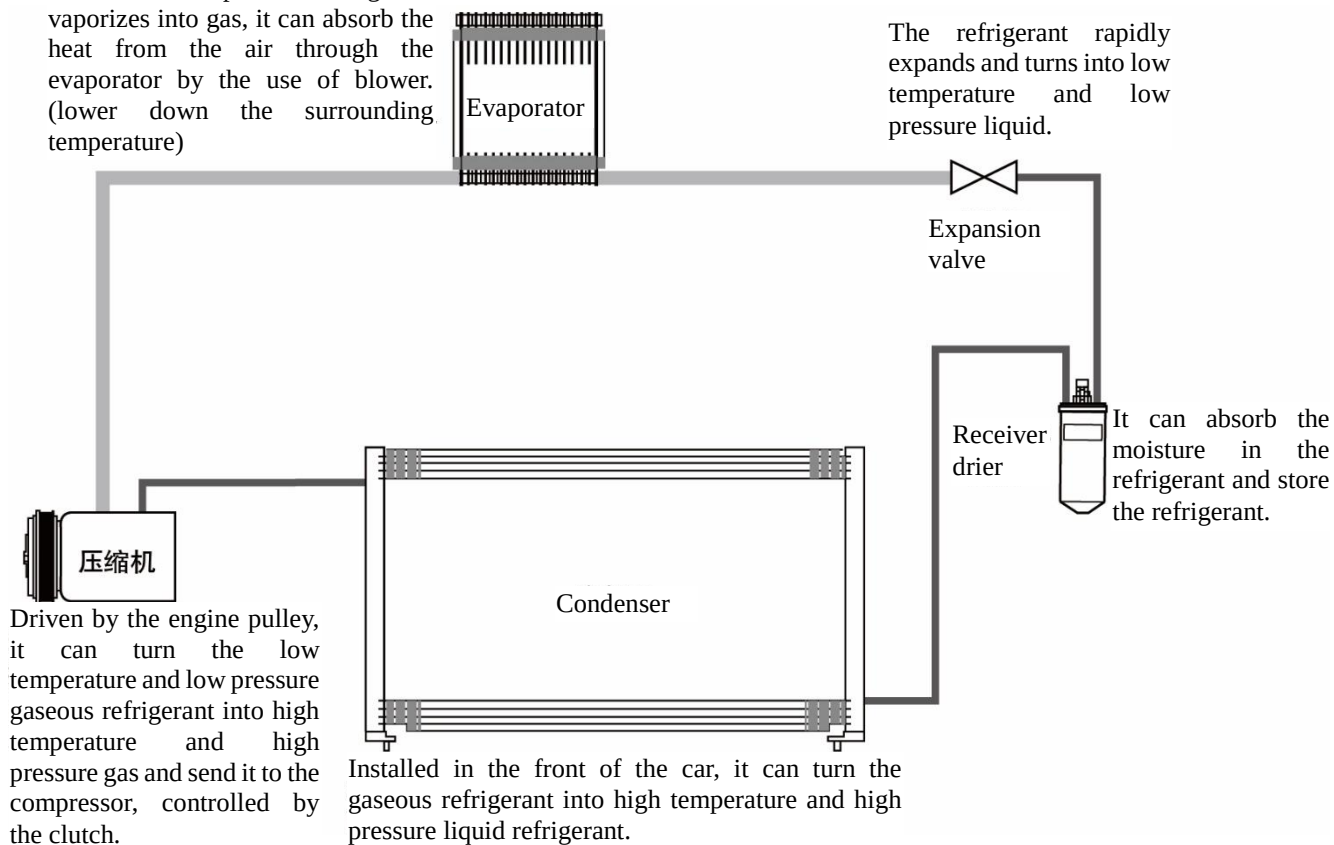
(III) Operating Principle

A/C control system operating principle



Refrigerating principle diagram

When the vaporific refrigerant vaporizes into gas, it can absorb the heat from the air through the evaporator by the use of blower. (lower down the surrounding temperature)



Air flow to be changed according to the following pattern:

Wind control	Operating position	Operation
Wind speed regulating		Rotate fan control button, clockwise rotating knob can increase fan speed, anticlockwise rotating knob can decrease fan speed.
Rear window defrost		Pressing the button can open or close rear window defrosting function.
A/C		Pressing the button can open or close A/C compressor. When pressing A/C button indicator light on button will be on, which indicates A/C compressor already starts and begins to refrigerate; pressing the button again can close A/C compressor. When weather is hot, open vehicle window to exhaust hot air in vehicle, and then close vehicle window. It is helpful to shorten required time of vehicle refrigerating, and also helpful to improve system running efficiency.
Internal circulation mode		This mode is to prevent external air from getting into vehicle. It can be used to prevent external air and abnormal smell from getting into vehicle, or used to increase or decrease air temperature inside vehicle more fast. Pressing this button can open or close internal circulation mode. Using internal circulation mode for long time may cause window fogging. If window fogging, select defrost mode.
Mode regulating		This mode guides some air flow to floor air outlet, and guides some air flow to front windshield and side window to defrost.
Mode regulating		This mode guide most air flow to floor air outlet. Make sure there is no obstacle under front seat to guide air flow to the back of carriage.
		This mode guides some air flow to front air outlet of dashboard, and guides some air flow to floor air outlet.
		This mode guides air flow to front air outlet of dashboard.
		This mode guide most air flow to front windshield and side window to demist. This mode guide most air flow to front windshield and side window to defrost.

(IV) Maintenance Parameter/Technical Parameter

Item	State	Parameter	Remark
Refrigerant filling amount	Replace pipe	30cc	When replacing compressor, subtract
	Replace condenser	30cc	The result that minus the amount of refrigerant oil discharged from old compressor in the amount of
	Replace evaporator	30cc	120ml is the required amount that needs to be discharged from new compressor.

△Note Even though there is no refrigerant discharged from removed compressor, don't discharge more than 50ml refrigerant from new compressor.

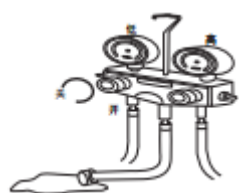
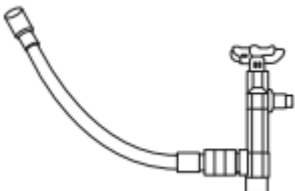
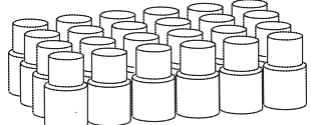
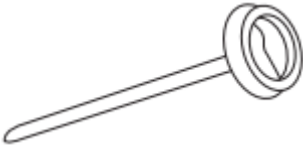
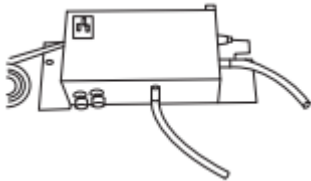
(V) Maintenance Note

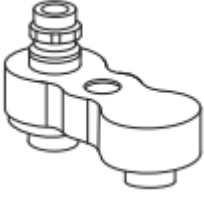
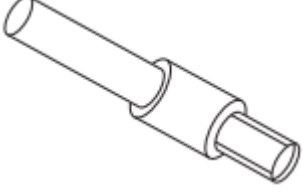
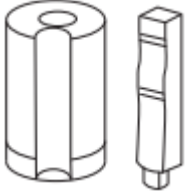
△Warning Please obey to the following notes when checking and maintaining A/C system, or else it may cause vehicle damage and personal injury.

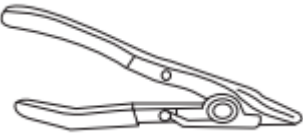
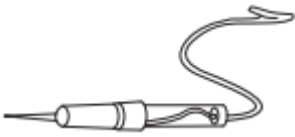
1. Freezing point of refrigerant is low, and volatility is high, thus must use gloves and glasses in order to prevent phenomenon of skin pernio and blindness due to contact with skin.
2. If refrigerant splashed to eyes or contact with skin, should clean contact part with clean water immediately, and must go to ophthalmology department and dermatology department to consult. Don't kneading eyes by eyes or handkerchief.
3. When do operation related to refrigerant, place must be ventilated. A large amount of refrigerant discharged in enclosed place will cause hypoxia phenomenon.
4. Refrigerant discharged permitted amount: 1000ppm (ppm is volume of the material contained in the air of the one million volume) (4184mg/ m³); when discharged amount too much, it may cause heart and cardiovascular system, immune system abnormal or irritability; respiratory system abnormal or skin disease.
5. When doing operation related to refrigerant, make sure there is no foreign matter of moisture and dust around, this foreign matter will flow into A/C system and will be harmful to system.
6. When doing operation related to refrigerant, must prepare gas leakagemeter. When R-134a refrigerant contact with high temperature obstacle, it will produce harmful gas, therefore pay attention to prevent leakage.
7. A/C system of the vehicle must use R-134a refrigerant. If using other refrigerant, it will cause bad influence to system component.
8. R134a refrigerant and R-12 refrigerant are imcompatible, thus little amount can't be mixed.
9. When doing operation related to refrigerant, make sure there is no pyrophorus or combustibile obstacle around vehicle, and pay special attention that refrigerant jar will cause bomb in heat source.
10. R134a container is high pressure state, must not be placed in high temperature environment, and must check whether storage environment temperature is under 52°C.
11. A/C component generally uses dustproof cover in order to prevent drainage, dust, moisture flowing in. Dustproof cover should be removed before operating and sealed after operating.
12. Synthetic oil (PAG) with R-134a is more easier to absorb water than R-12, and absorptivity is 10 times higher than mineral oil (MINERAL). Too much water will infect compressor, lubrication function and durability.
13. Influence of moisture to A/C system is very bad, therefore it's better to avoid operation in rain day.
14. When A/C system re-installed after removed, should spread refrigeration oil to O-type seal ring, especially bolt-type connection part, should first be installed manually and then assemble with two spanners.
15. When assembling flange-type connection part, should push pipe slightly and connect nut and bolt.
16. When installing A/C, assembling with torque more than required torque or force of clamping O-type seal ring too large will cause refrigerant leakage, therefore operate according to required.
17. Hose can't be distorted.
18. Don't separate A/C system before recycling refrigerant absolutely. If separated before recycling, it will discharge refrigerant and refrigeration oil under the influence of system pressure, and it may pollute environment.
19. When replacing A/C component, must fill refrigeration oil (type: PAG) when filling refrigerant and refrigeration oil.

(VI) Special Tool

No.	Tool No.	Tool name	Outside drawing	Use
1		Digital multimeter		

No.	Tool No.	Tool name	Outside drawing	Use
2		High strength invisible lights		
3		Pliers		
4		R-134a manifold gauge		
5		Halogen leak detector		
6		Tracer color syringe		
7		R134a tracer pigment		
8		Micro thermometer		
9		Forward flow control valve		

No.	Tool No.	Tool name	Outside drawing	Use
10		Seal protector device		
11		50 pounds recycling tanks		
12		Pressure test adapter		Connecting A/C pressure tester and A/C pipes
13		A/C system lip seal removal tool		Removal A/C system lip seal
14		O-type seal removal tool		Remove O-type seal ring
15		Valve core removal and installation tool		Remove and install valve core
16		O-type seal ring installation tool		Install O-type seal ring
17		Spring clip pliers		Remove and install spring clip

No.	Tool No.	Tool name	Outside drawing	Use
18		Spring clip pliers		Remove and install spring clip
19		Refrigerant recycle\ regeneration and refilling system		Recycle and fill refrigerant
20		Passive test lamp		A/C system leakage inspection

II、Troubleshooting

Troubleshooting List

No.	Fault Phenomenon	Fault reason analysis	Solution	Remark
1	A/C system has no refrigerant	System exists leakage	Check with eyes : 1. Observe whether there is oil stain in connection parts of all components; if any, it indicates there is leakage here. Spread suds to suspected part and observe whether there is bubble. 2. Observe whether there is abnormal failure, whether there is scraping, flattening and bruise on surface of condenser and evaporator core.	
			With vacuumizing mode, listen to the part position if there is “zizi” sound, which indicates the leakage.	
			Check with instrument : 1. Electronic leak detector with high sensitivity; 2. Dye-guided detection method	
2	System refrigeration oil not right amount	Replace system component, fill or reduce according to rules	1. Firstly ensure specification of refrigeration oil, can't be mixed; generally using specification: PAG 2. After recycling refrigerant, replenish about 30g refrigeration oil 3. Replace compressor, pour out all refrigeration oil in compressor and fill the same refrigeration oil with replaced compressor 4. Replace pipe: replenish about 30g refrigeration oil 5. Replace condenser: replenish about 60g refrigeration oil 6. Replace evaporator: replenish about 50g refrigeration oil 7. Replace dryer: replenish about 10g refrigeration oil	
3	Blowing rate abnormal	A/C has no wind	Circuit fault Refer to “Blower not work” Machinery fault 1. Blower motor damaged, replace motor 2. Temperature air door mechanism damaged, and cannot adjust air door to refrigeration state 3. A/C controller damaged, replace A/C control module 4. Speed regulating resistance damaged, replace speed control module	
		A/C blowing rate small	1. Voltage not enough, check power supply 2. Whether air duct is blocked, whether grille is fully opened 3. Check whether face air blow has leakage 4. Speed control module fault, replace speed control module 5. Whether air filter has excessive windage, whether there is dust and foreign matters blocked 6. Blower motor rotates in reverse direction, adjust positive and negative electrode of connector	
4	A/C refrigerate not	System has no refrigerant	Refer to “A/C system has no refrigerant”	
		Not blow	Refer to “Blowing rate abnormal”	
		Compressor not work	Circuit fault Refer to “Compressor not work” Machinery fault 1. Drive belt broken, replace 2. Compressor internal fault, replace	
5	A/C refrigeration is not good	Refrigerant not enough	1. Check whether pressure is in normal value range; if lack of refrigerant, refill it. 2. Check whether system has micro leakage	
		Refrigeration oil too	1. Discharge redundant refrigeration oil, and refill the	

No.	Fault Phenomenon	Fault reason analysis	Solution	Remark
		much	satisfactory amount of refrigeration oil	
		Compressor is abnormal	1. Compressor belt or clutch slips	
		Blowing rate is small	Refer to “Abnormal blowing rate”	
		Abnormal pressure	High pressure is lower than normal value, low pressure is lower than normal value 1. Expansion valve is blocked, clear obstructions 2. Opening degree of expansion valve is not enough, adjust expansion valve or replace 3. Refrigerant is little, add refrigerant High pressure is higher than normal value, low pressure is higher than normal value 1. Condenser radiating is not good; Check condenser fan and replace faulted 2. Refrigerant is too much, release some High pressure is lower than normal value, low pressure is higher than normal value 1. Compressor malfunctions, lack of capacity, needs to be replaced 2. Refrigerant not enough, add refrigerant High pressure is higher than normal value, low pressure is lower than normal value 1. There is impurity blocking in the system	
6	A/C system no heating	Heater core has no hot water	Heating pipe gets blocked, clear obstacle	
		A/C not blowing wind	Refer to “Blowing rate abnormal”	
		Controller fault	Temperature regulation of controller damaged, and can't adjust temperature air door to maximum heating, replace controller	
7	A/C system heating is not good	Heating water circulation not enough	Check whether engine coolant supply is insufficient, engine failure	
		Poor circulation inside heater core	Clear obstacle in heater core, or replace heater	
		Blowing rate is small	Refer to “Blowing rate abnormal”	
		Mode air door is wrong	Temperature air door's rotation is not in place, and there is a mix of cold and hot	
8	A/C system has abnormal sound	Compressor has abnormal sound	Open A/C, compressor works; check whether there is fractive sound in clutch; if any, please replace compressor	
		Pipe expansion valve has abnormal sound	Start the A/C, check if there is flowing “chirps” sound in the expansion valve. Adjust the expansion valve and replace it.	
		Air door mechanism has abnormal sound	If there is resistance when adjusting the damper bodies; whether there is "ticking" or "giggle" sound; if there is such phenomenon, smear lubrication oil in the damper body or replace body parts.	
		Motor damaged	Replace motor	
		Temperature air	Replace temperature air door mechanism	

No.	Fault Phenomenon	Fault reason analysis	Solution	Remark
		door mechanism damaged, and can't adjust air door to refrigeration state		
		Blower has abnormal sound	There is abnormal sound in blower 1. A "humming" sound; confirm if the motor rotates reversely; adjust plug-line; 2. "Creak" or "Zizi" sound; the motor is damaged, and replace the motor; 3. "Pop" sound; if there is a foreign body in the volute, remove and check the volute. Blower is not installed firmly, resulting in vibration and abnormal sound.	
		There is water sound in heater core	1. Idling and stepping on the accelerator (compressor does not start) to the degree that the condenser fan rotates at high speed; 2. Continue to step on the accelerator to the degree that the engine speed exceeds 5000 rpm with the duration of one minute; 3. Stop accelerating, idle and drastic acceleration to confirm whether there is still water flow sound; if so, follow step ② until no sound of water.	
9	A/C system has peculiar smell	Filter mildew	Remove the filter to check if the surface has serious pollution, and timely replace it when necessary.	
		Radiator surface has been polluted	Whether the surface of evaporator and heater contains oil in production; if it has, remove and clean it.	
		Poor drainage of condenser water	Condensate water cannot be excluded entirely, and there is water in the case, resulting in deteriorating; replace the outlet location.	

(I) Troubleshooting Flow Chart

Blower not work

Step	Check content	Solution	Judgement specification	Next step	
				Yes	No
1	Check blower relay fuse	Remove blower relay fuse IF37, and measure whether blower relay fuse IF37 is fused by multimeter.	Whether fuse is fused?	Maintain fuse short circuit fault and replace fuse	Go to step 3
2	Check voltage value of blower relay control circuit	Measure voltage value between blower relay ER2-86 terminal and reliable ground.	Voltage standard value: 11~14V	Next step	Replace relay
3	Check blower fuse	Remove blower relay fuse ESF04, and measure whether blower relay fuse ESF04 is fused by multimeter.	Whether fuse is fused?	Maintain fuse short circuit fault and replace fuse	Go to step 3
4	Check voltage value of blower relay controlled circuit	Measure voltage value between blower relay ER2-30 terminal and reliable ground.	Voltage standard value: 11~14V	Next step	Maintain failure circuit

Step	Check content	Solution	Judgement specification	Next step	
				Yes	No
5	Check connected circuit between blower relay and blower wiring harness	Measure resistance value between blower wiring harness connector M44-2 terminal and ER2-87 terminal.	Standard resistance value: less than 1Ω	Next step	Maintain failure circuit
6	Check connected circuit between blower wiring harness and A/C control panel wiring harness connector	Measure resistance value between blower wiring harness connector M44-1 terminal and A/C control panel wiring harness connector M30-4 terminal.	Standard resistance value: less than 1Ω	Next step	Maintain failure circuit
7	Replace blower	Remove blower, and install new blower. Adjust blowing rate button to check whether blower works normally.	Blower works normal	System is normal	Next step
8	Ensure system is normal				

Compressor not work

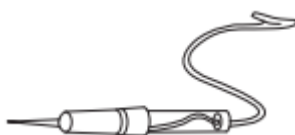
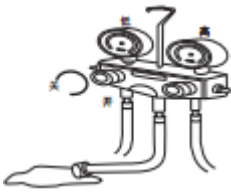
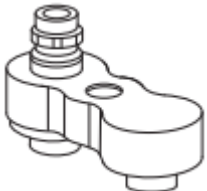
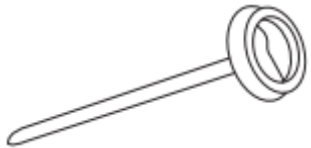
Step	Check content	Solution	Judgement specification	Next step	
				Yes	No
1	Check A/C compressor relay fuse	Remove A/C compressor relay fuse EF02, and check whether blower relay fuse EF02 is fused.	Whether fuse is fused?	Maintain fuse circuit short circuit fault, and replace fuse	Go to step 3
2	Check voltage value of A/C compressor relay control circuit	Check voltage value between blower relay ER2-86 terminal and reliable ground.	Voltage standard value: 11~14V	Next step	Replace relay
3	Check A/C compressor fuse	Remove A/C compressor fuse EF04, and check whether blower relay fuse EF04 is fused.	Whether fuse is fused?	Maintain fuse circuit short circuit fault, and replace fuse	Go to step 3
4	Check voltage value of A/C compressor relay controller circuit	Check voltage value between blower relay ER05-30 terminal and reliable ground.	Voltage standard value: 11~14V	Next step	Maintain failure circuit
5	Check circuit between A/C compressor relay and A/C compressor wiring harness connector	Measure resistance value between A/C compressor connector B05-1 terminal and ER05-87 terminal by multimeter.	Standard resistance value: less than 1Ω	Next step	Maintain failure circuit
6	Check circuit between A/C compressor relay and ECU wiring harness connector	Measure resistance value between A/C compressor relay ER05-86 terminal and ECU wiring harness connector A22-10 terminal by multimeter.	Standard resistance value: less than 1Ω	Next step	Maintain failure circuit
7	Replace ECU	Disconnect ECU wiring harness, remove ECU, and replace new ECU. Check whether A/C compressor works normally.	Whether compressor works normally?	System is normal	Next step

Step	Check content	Solution	Judgement specification	Next step	
				Yes	No
8	Replace A/C pressure switch	Disconnect pressure switch wiring harness connector, and replace A/C pressure switch/	Whether compressor works normally?	System is normal	Next step
9	Check circuit between A/C pressure switch wiring harness connector and ECU wiring harness connector	Use multimeter to respectively measure resistance value of A/C pressure switch wiring harness connector E15-2 terminal and ECU wiring harness connector A22-79 terminal, A/C pressure switch wiring harness connector E15-4 terminal and ECU wiring harness connector A22-40 terminal.	Standard resistance value: less than 1Ω	Next step	Maintain failure circuit
10	Check circuit between A/C pressure switch wiring harness connector and A/C control panel wiring harness connector	Use multimeter to respectively measure resistance value of A/C pressure switch wiring harness connector E15-1/E15-3 terminal and A/C control panel wiring harness connector M29-23 terminal.	Standard resistance value: less than 1Ω	Next step	Maintain failure circuit
11	Check circuit between evaporator temperature sensor wiring harness connector and A/C control panel wiring harness connector	Use multimeter to respectively measure resistance value of evaporator temperature sensor wiring harness connector M40-1 terminal and A/C control panel wiring harness connector M29-8 terminal, evaporator temperature sensor wiring harness connector M40-2 terminal and A/C control panel wiring harness connector M29-9 terminal.	Standard resistance value: less than 1Ω	Next step	Maintain failure circuit

12	Check evaporator temperature sensor	Measure resistance value of evaporator temperature sensor by multimeter.	Judge whether resistance value corresponding to evaporator temperature sensor temperature-resistance list?	Next step	Replace evaporator temperature sensor
13	Replace A/C control panel	Remove fixed bolts of A/C control panel, disconnect A/C control panel wiring harness connector, and replace new A/C control panel	Whether compressor works normally?	System is normal	Next step
14	Replace A/C compressor	Disconnect A/C pipe, remove fixed bolts of compressor, and replace A/C compressor	Whether compressor works normally?	System is normal	Next step
15	Ensure system is normal				

III、A/C Check and Filling Refrigerant

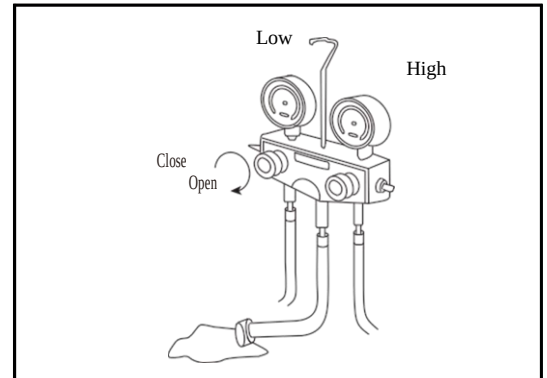
(I) Special Tool

No.	Tool No.	Tool name	Tool diagram
1		Refrigerant recycling/ regeneration, refilling system	
2		Passive test lamp	
3		R-134A manifold gauge	
4		50 pounds recycling tank	
5		Pressure test adapter	
6		Microthermometer	

(II) Refrigerant Filling and Discharging

1. Install refrigerant filling instrument

- 1). Close manual valves at both ends of refrigerant filling instrument.
- 2). The filling pipe of the refrigerant filling instrument is installed in joints. Low-pressure pipe to the low pressure nozzle and high pressure pipe to the high-pressure nozzle. Tighten the nut by hands after connection.



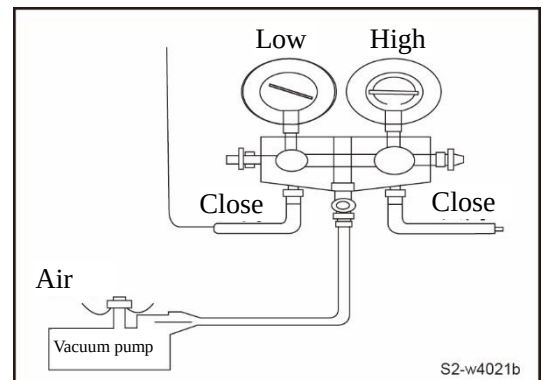
2. Operations of discharging refrigerant

- 1). Connect the refrigerant filling instrument to the system.
- 2). Put a clean rag in the open part of central hose.
- 3). Gradually open the high pressure manual valve to discharge refrigerant.
 Δ Caution Exhausting gas velocity too fast may result in the discharging of the refrigeration oil from the compressor.
- 4). Check if there is the trace of refrigeration oil on the rag. If there is the trace, slightly close the manual valve.
- 5). When the filling instrument ruler decreases to $3.5\text{kg}/\text{cm}^2$, slowly open the low pressure manual valve.
- 6). To reduce the system pressure, slowly open the high pressure and low pressure manual valve until the ruler indicates $0\text{kg}/\text{cm}^2$.

3. Vacuum operation for refrigeration system

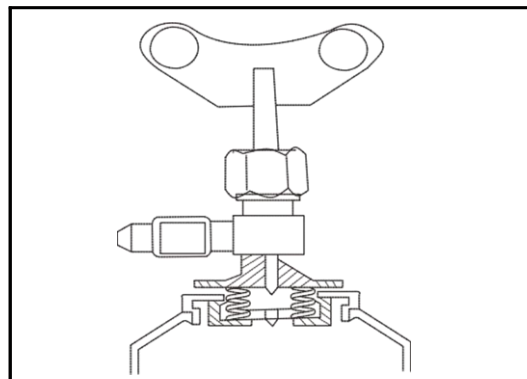
Δ Caution System must be vacuumized after discharging refrigerant. This operation is supposed to exclude the air and moisture in the system, and it should be started in 15 minutes after all the parts are installed.

- 1). Confirm if the engine stays in “shut down”.
- 2). Connect the filling instrument to the compressor contact joint, and close the two ends.
- 3). Confirm if the refrigerant is excluded from the system.
- 4). Central pipe is connected to the intake port of the vacuum pump.
- 5). Open the high pressure/low pressure valve of the filling instrument after operating the vacuum pump.
- 6). After 10 minutes, the low pressure detector scale should be higher than $0.96\text{kg}/\text{cm}^2$ vacuum. Otherwise, the system has leakage and should be repaired as following steps.
 -Use refrigerant container filling system.
 -Use leakage detector to check the leakage. If the leakage is detected, repair it.
 -Exclude the refrigerant and vacuumize the system.
 - If the leakage does not occur, continue to vacuumize.
- 7). Operate the vacuum pump again.
- 8). Filling instrument scale for both ends should keep $0.96\text{kg}/\text{cm}^2$ vacuum.
- 9). Continue to vacuumize until the ruler indicates $0.96\text{kg}/\text{cm}^2$.
- 10). About 15 minutes after the implementation of vacuum operation, close the pressure valve of the filling instrument and stop vacuumizing; separate pipes from the pump. In this way, refrigerant can be added.

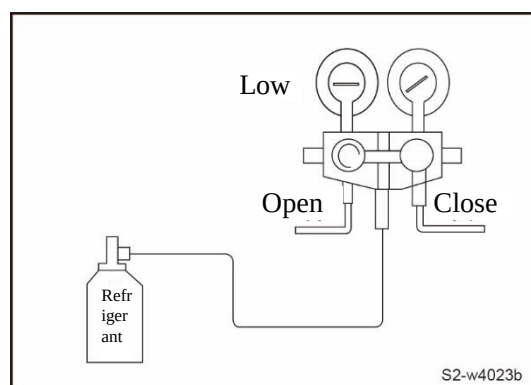


4. Use refrigerant control valve

- 1). Before the valve is connected to the refrigerant container, completely turn the handle counterclockwise.
- 2). Turn counterclockwise until the disc reaches the highest position.
- 3). After connecting of the central pipe to the valve device, rotate the disc clockwise by hand.



- 4). Turn the handle clockwise and fill hole in the upper portion of the sealing part.
- 5). Loosen the nuts connecting the filling instrument center connector and pipe.
- 6). After a few seconds of exhaust, tighten the nut.



5. Adding refrigerant (Gaseous state)

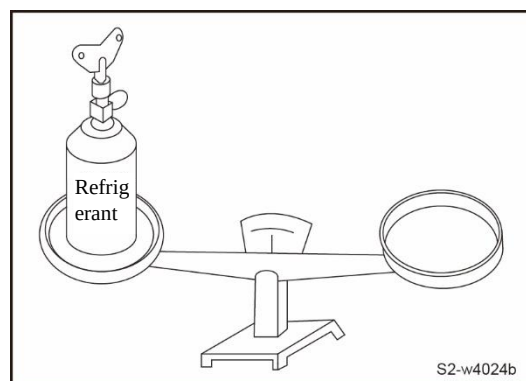
△ Caution This operation is by means of the device on low pressure side to add the gaseous refrigerant into the system. At this time the refrigerant container should be put vertical so that the gaseous refrigerant would flow into the system.

- 1). Install the refrigerant container on the adjusting valve.
- 2). Open the low pressure valve; adjust the valve until the low pressure scale stays below 4.2kg/m^2 .
- 3). Start the engine and start the air condition.

△ Caution To prevent the liquid refrigerant flows into compressor through the intake port, put the container vertical.

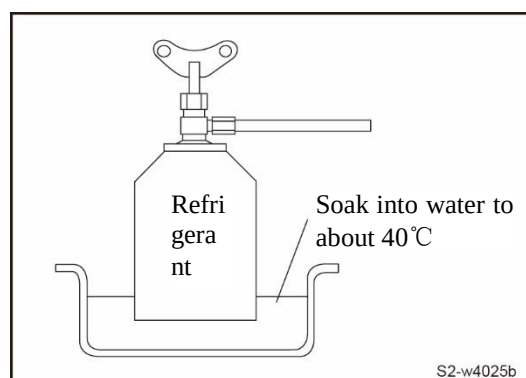
- 4). When add the regulated amount of refrigerant, close the low pressure valve.

Regulated amount of filling refrigerant: $460 \pm 20\text{g}$



- 5). If the refrigerant filling speed is too slow, you can put the container into a container of water of about 40°C .

△ Caution Under any circumstances, do not keep the water heated to above 52°C , and hot light should not touch the container.



6. Adding refrigerant (liquid state)

△ Caution This operation is by means of high pressure side filling. Upend the refrigerant container so that the refrigerant would flow into the system.

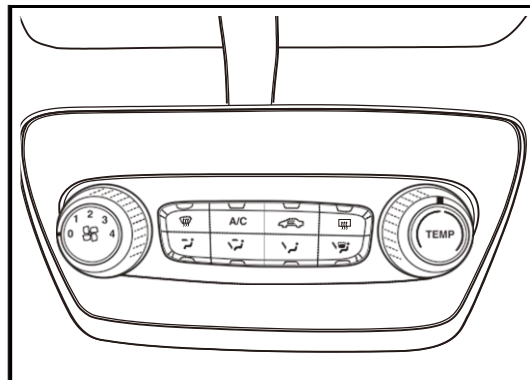
- 1). After the system is vacuumized, completely close both ends of high/low pressure valve.
- 2). Install the adjusting valve of refrigerant container.
- 3). Upend the container after the high pressure valve is fully opened.
- 4). The exclude pressure will increase when the system is over filled. Therefore, when measure the refrigerant weight, fill with correct amount and close the high pressure valve.
Regulated amount of filling refrigerant: $460 \pm 20\text{g}$
- 5). After adding regulated amount of refrigerant, close the filling instrument valve.
- 6). Use leakage detector to check if there is leakage.

△ Caution When use high pressure side filling, the engine will not be started. By use of liquid refrigerant filling, low pressure valve cannot be opened. Performance test should be conducted before separating the filling instrument.

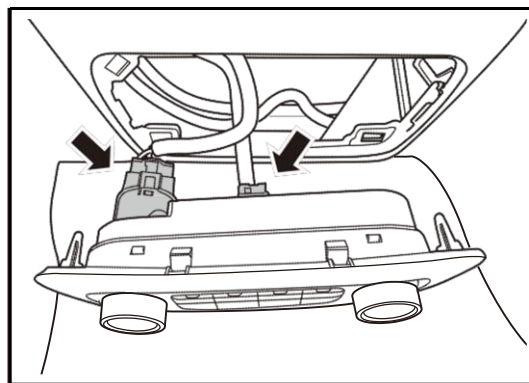
IV、A/C Controller Assembly

(I) Removal

1. Open the engine compartment hood.
2. Disconnect the negative cable of the battery. Refer to “Disconnection and connection of battery electrode”
3. Disassemble the air condition control module assembly.
 - 1). Pry out the air condition control module;

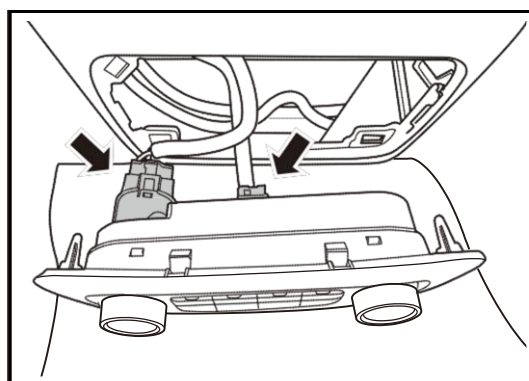


- 2). Disconnect the wiring harness connector of the air condition control module assembly;
- 3). Remove the air condition control module;



(II) Installation

1. Install air condition control module assembly
 - 1). Connect the wiring harness connector of the air condition control module assembly;
 - 2). Press the air condition control module with the installation panel assembly into the installation hole and make sure it is in place;

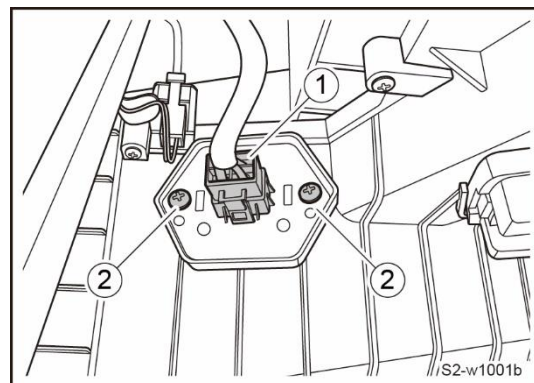


2. Connect the cable to the negative pole of the battery;
3. Close the engine compartment hood;

V、Speed Regulating Resistance

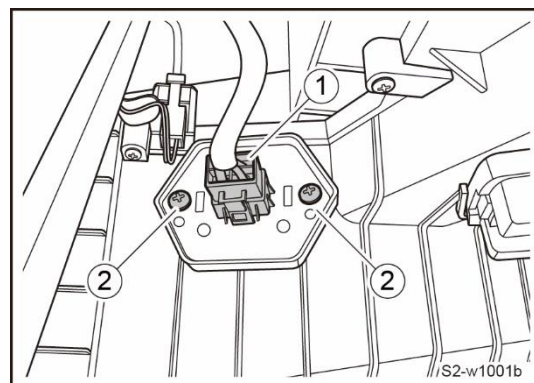
(I) Removal

1. Open engine cabin cover;
2. Disconnect battery negative electrode; refer to “Disconnection and connection of battery electrode”
3. Remove glove box assembly; refer to “Glove box assembly”;
4. Remove speed regulating resistance;
 - 1). Disconnect wiring harness connector ① of speed regulating resistance;
 - 2). Remove 2 fixed bolts ②;
 - 3). Take down speed regulating resistance;



(II) Installation

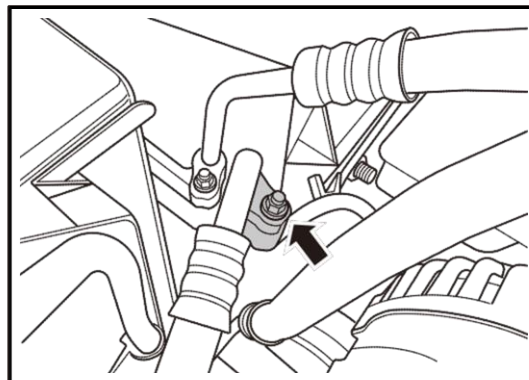
1. Install speed regulating resistance
 - 1). Place speed regulating resistance to installation position, and tighten 2 fixed bolts ②;
 - 2). Connect wiring harness connector ① of speed regulating resistance;
2. Install glove box assembly;
3. Connect battery negative electrode;
4. Close engine cabin cover;



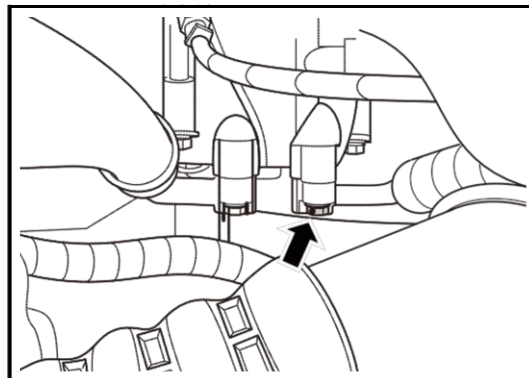
VI、Exhausting Pipe Assembly

(I) Removal

1. Open engine cabin cover
2. Remove intake hose; refer to “intake hose assembly”
3. Recycle refrigerant, refrigeration oil; refer to “Refrigerant, refrigeration oil”
4. Remove exhausting pipe assembly
 - 1). Remove 1 fixed nut of exhausting pipe assembly and condenser assembly;

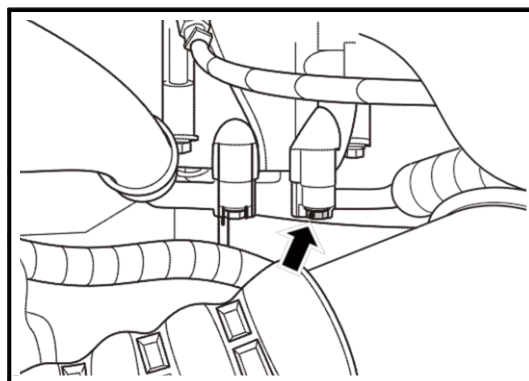


- 2). Remove 1 fixed bolt of exhausting pipe assembly and compressor assembly;
- 3). Take down exhausting pipe assembly;

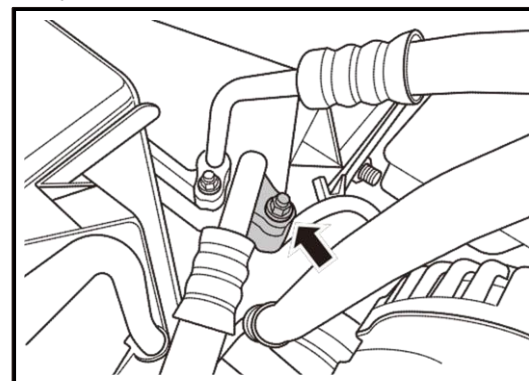


(II) Installation

1. Install exhausting pipe assembly
 - 1). Place exhausting pipe assembly to installation place, and tighten 1 fixed bolt of exhausting pipe assembly and compressor assembly;



- 2). Tighten fixed nut of exhausting pipe assembly and condenser assembly;

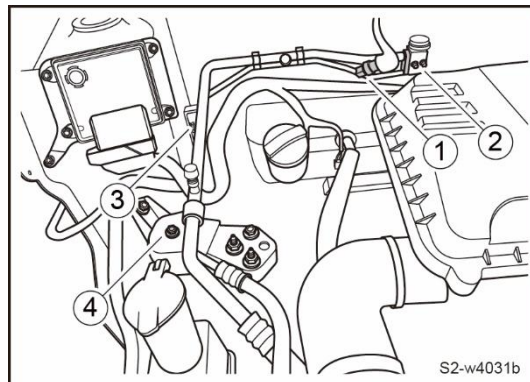


2. Fill refrigerant and refrigeration oil
3. Install intake hose
4. Close engine cabin cover

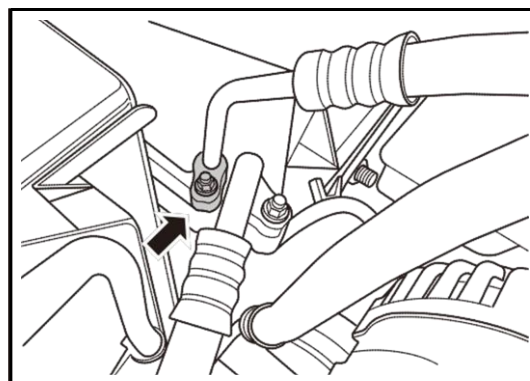
VII、 Pipe and Expansion Valve Assembly

(I) Removal

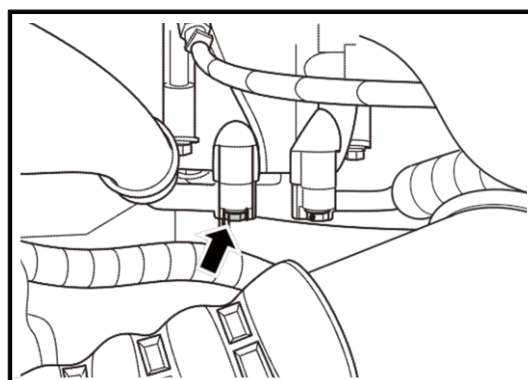
1. Open engine cabin cover
2. Disconnect battery negative electrode; refer to “Disconnection and connection of battery electrode”
3. Remove intake hose; Refer to “Intake hose assembly”
4. Recycle refrigerant, refrigeration oil; Refer to “Refrigerant and refrigeration oil”
5. Remove pipe and expansion valve assembly
 - 1). Disconnect wiring harness connector of ternary pressure switch;
 - 2). Remove 2 fixed bolts of expansion valve assembly and A/C host;
 - 3). Remove fixed bolt of pipe and expansion valve assembly and vehicle body;
 - 4). Remove fixed bolt of pipe and expansion valve assembly and right front suspension;



- 5). Remove fixed bolt of pipe and expansion valve assembly and condenser assembly;



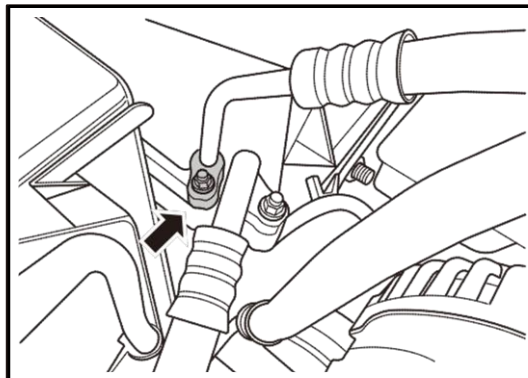
- 6). Remove fixed bolt of pipe and expansion valve assembly and compressor assembly;
- 7). Take down pipe and expansion valve assembly;



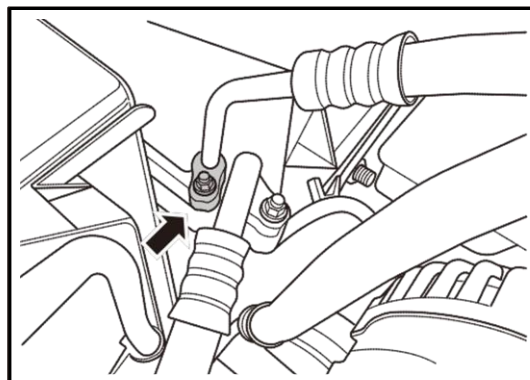
(II) Installation

1. Install pipe and expansion valve assembly

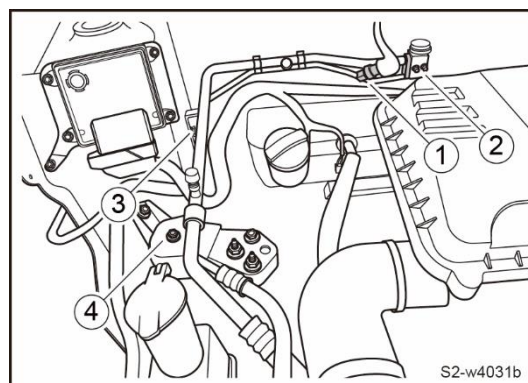
- 1). Place pipe and expansion valve assembly to installation position, and tighten fixed bolt of compressor assembly;



- 2). Tighten fixed nut of pipe and expansion valve assembly and condenser assembly;



- 3). Tighten fixed bolt of pipe and expansion valve assembly and right front suspension.
- 4). Tighten fixed bolt of pipe and expansion valve assembly and vehicle body suspension.
- 5). Tighten 2 fixed bolts of expansion valve assembly and A/C host.



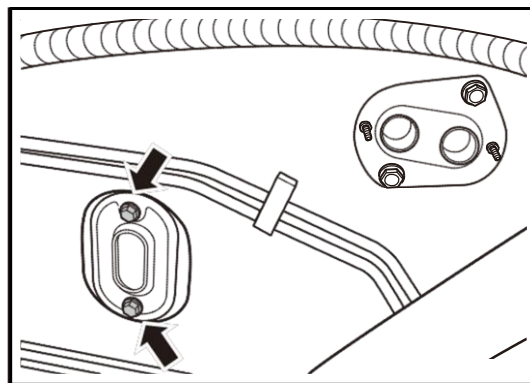
- 6). Connect wiring harness of ternary pressure switch.

2. Fill refrigerant, refrigeration oil
3. Install intake hose
4. Connect battery negative electrode
5. Close engine cabin cover

VIII、Evaporator Core Intake/Outtake Shield Sleeve Assembly

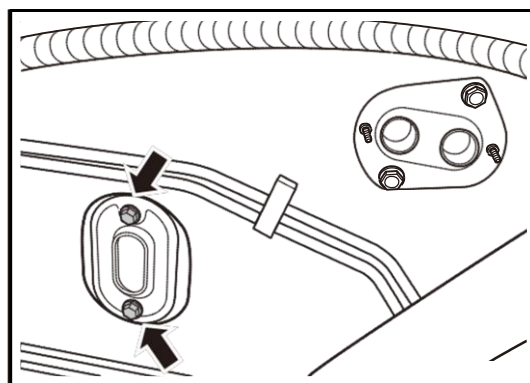
(I) Removal

1. Open engine cabin cover
2. Remove intake hose; refer to “Intake pipe assembly”
3. Recycle refrigerant, refrigeration oil; refer to “Refrigerant, refrigeration oil”
4. Remove pipe and expansion valve assembly; refer to “Pipe and expansion valve assembly”
5. Remove evaporator core intake/outtake shield sleeve assembly
 - 1). Remove 2 fixed bolts of evaporator core intake/outtake shield sleeve assembly.
 - 2). Take down evaporator core intake/outtake shield sleeve assembly.



(II) Installation

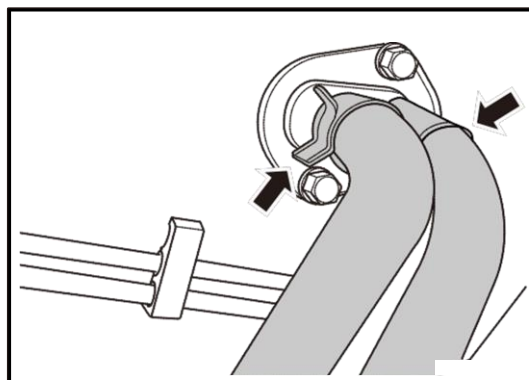
1. Install evaporator core intake/outtake shield sleeve assembly
 - 1). Place the evaporator core intake/outtake shield sleeve assembly to the installation position, and tighten 2 fixed bolts.
2. Install pipe and expansion valve assembly
3. Fill refrigerant, refrigeration oil
4. Install intake hose
5. Close engine cabin cover



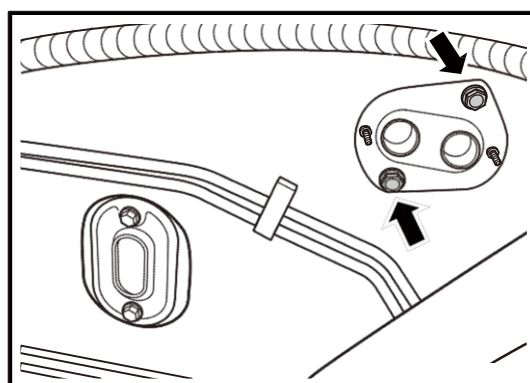
IX 、 Warm Air Inlet/Outlet Sheath Assembly

(I) Removal

1. Open engine hood cover
2. Remove warm air inlet/outlet sheath assembly
 - 1). Disconnect flexible clamp, and disconnect connection of warm air inlet/outlet water pipe and A/C host;

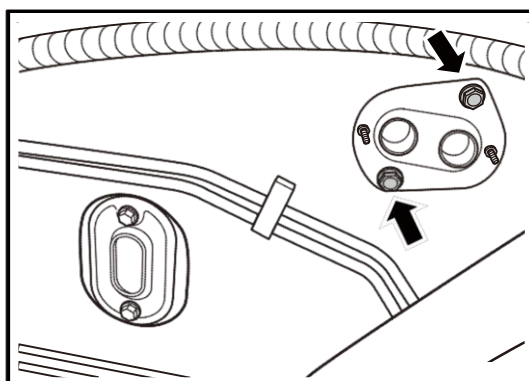


- 2). Remove 2 fixed bolts of warm air inlet/ outlet sheath assembly;
- 3). Take down warm air inlet/outlet sheath assembly;

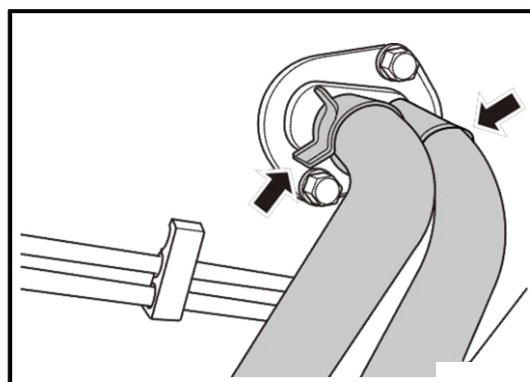


(II) Installation

1. Install warm air inlet/outlet sheath assembly
 - 1). Place warm air inlet/outlet sheath assembly to installation position, and tighten 2 fixed bolts;



- 2). Connect connection of warm air inlet/outlet water pipe and A/C host, and connect connection position by flexible clamp;

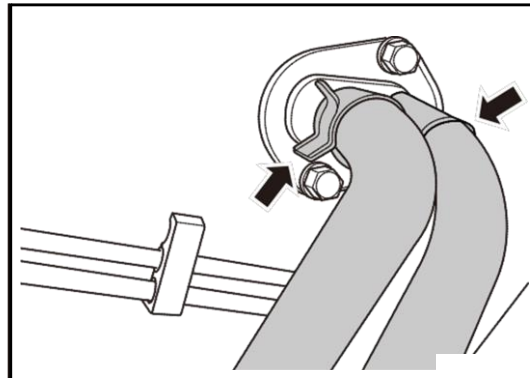


2. Close engine hood cover

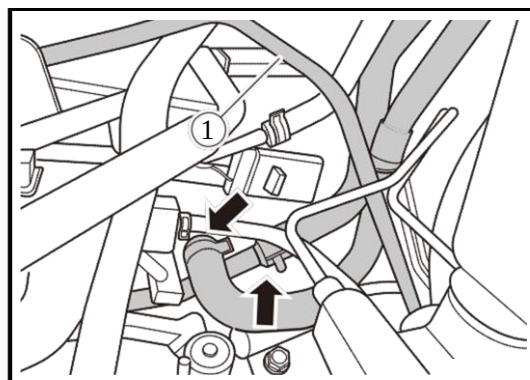
X、 Warm Air Inlet/Outlet Water Pipe Assembly

(I) Removal

1. Open engine hood cover
2. Remove warm air inlet/outlet water pipe assembly
 - 1). Disconnect flexible clamp, and disconnect connection of warm air inlet/outlet water pipe and A/C host;

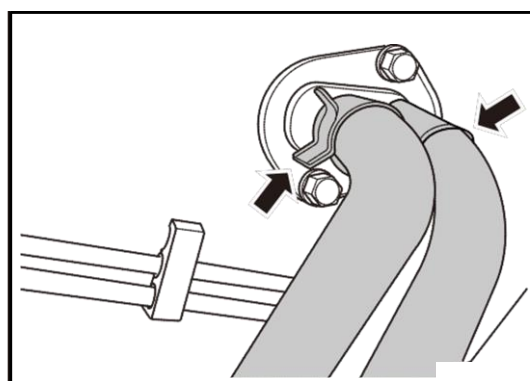


- 2). Disconnect flexible clamp, and disconnect connection of warm air inlet/outlet water pipe and engine inlet/outlet water pipe;
- 3). Disconnect connection of engine oil inlet pipe ① and warm air inlet/outlet water pipe clamp, and take down warm air inlet/outlet water pipe assembly;

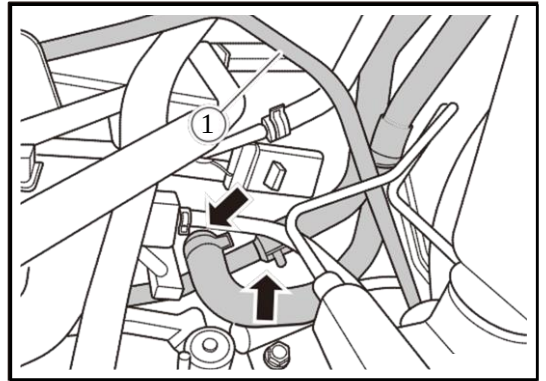


(II) Installation

1. Install warm air inlet/outlet water pipe assembly
 - 1). Connect connection of warm air inlet/outlet water pipe and A/C host, and connect connection position by flexible clamp;



- 2). Connect connection of warm air inlet/outlet water pipe and engine inlet/outlet water pipe, and connect connection position by flexible clamp;
- 3). Clamp rotating pipe clamp of warm air inlet/outlet water pipe to engine inlet/outlet water pipe ①;



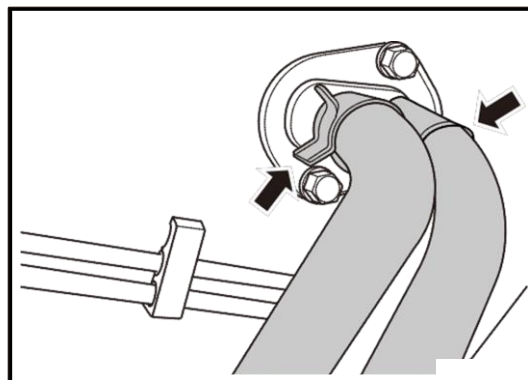
2. Close engine hood cover

XI、A/C Host Assembly

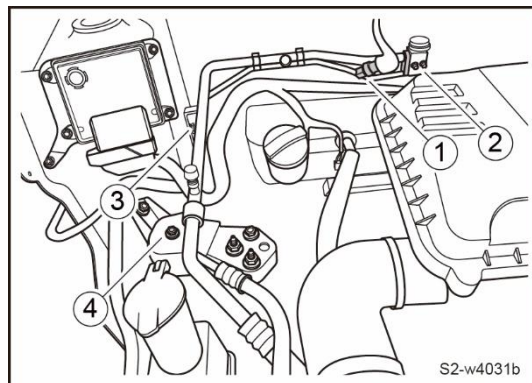
(I) Removal

1. Open engine hood cover
2. Disconnect negative electrode of battery Refer to “Disconnection and connection of battery cable”
3. Recycle refrigerant, refrigeration oil Refer to “Refrigerant, refrigeration oil”
4. Remove front extension plate Refer to “Auxiliary dashboard assembly”
5. Remove saucer cover plate assembly Refer to “Auxiliary dashboard assembly”
6. Remove front storage box assembly Refer to “Auxiliary dashboard assembly”
7. Remove auxiliary dashboard assembly Refer to “Auxiliary dashboard assembly”
8. Remove driver’s side air bag assembly Refer to “Driver’s side air bag assembly”
9. Remove steering wheel assembly Refer to “Steering wheel assembly”
10. Remove jacketing of steering column Refer to “Jacketing of steering column”
11. Remove combination switch assembly Refer to “Combination switch”
12. Remove threshold guard plate assembly of front door Refer to “Threshold guard plate assembly of front door”
13. Remove lower trim plate assembly of A column Refer to “Lower trim plate assembly of A column”
14. Remove upper trim plate assembly of A column Refer to “Upper trim plate assembly of A column”
15. Remove end cover of dashboard Refer to “End cover of dashboard”
16. Remove central right trim plate assembly Refer to “Central right trim plate assembly”
17. Remove glove box assembly Refer to “Glove box assembly”
18. Remove A/C controller assembly Refer to “A/C controller assembly”
19. Remove audio panel assembly Refer to “Audio panel assembly”
20. Remove audio assembly Refer to “Audio assembly”
21. Remove central left trim plate assembly Refer to “Central left trim plate assembly”
22. Remove combination meter Refer to “Combination meter”
23. Remove lower guard plate assembly of driver’s side Refer to “lower guard plate assembly of driver’s side”
24. Remove central cover assembly Refer to “Central cover assembly”
25. Remove front passenger’s side air bag Refer to “front passenger’s side air bag”
26. Remove dashboard assembly Refer to “Dashboard assembly”
27. Remove front wiper arm assembly Refer to “Front wiper arm assembly”
28. Remove ventilation cover plate assembly Refer to “Ventilation cover plate assembly”
29. Remove main wiring harness assembly Refer to “Main wiring harness assembly”
30. Remove dashboard beam Refer to “Dashboard beam”
31. Remove A/C host assembly

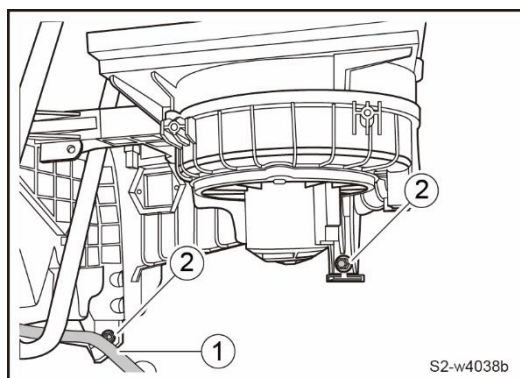
- 1). Disconnect flexible clamp, and disconnect connection of warm air inlet/outlet water pipe and A/C host;



- 2). Remove 2 fixed bolts of pipe and expansion valve assembly and A/C host;

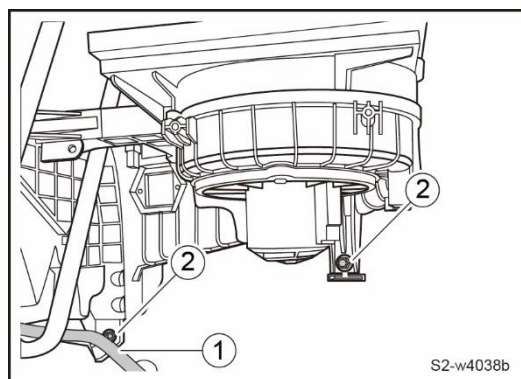


- 3). Lift right carpet, and pull out weeping pipe①;
- 4). Remove 2 fixed bolts ② of A/C host assembly;
- 5). Take down A/C host assembly;

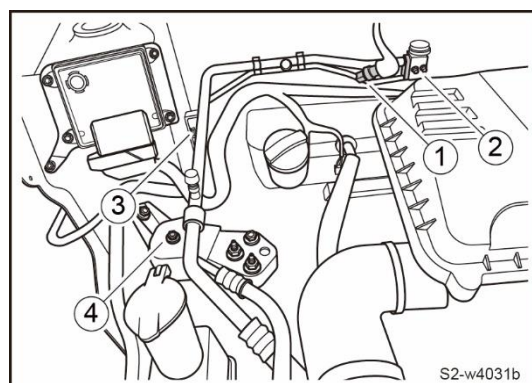


(II) Installation

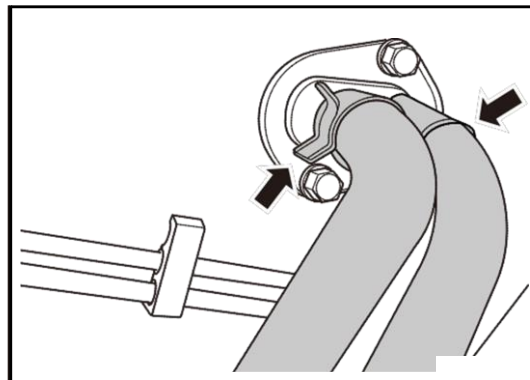
1. Install A/C host assembly
 - 1). Place A/C host to installation position, and tighten 2 fixed bolts ② of A/C host assembly
 - 2). Install outlet water pipe ①, and cover carpet;



- 3). Tighten 2 fixed bolts of pipe and expansion valve assembly and A/C host



4). Connect warm air inlet/outlet water pipe and A/C host, and tighten connection position by flexible clamp;

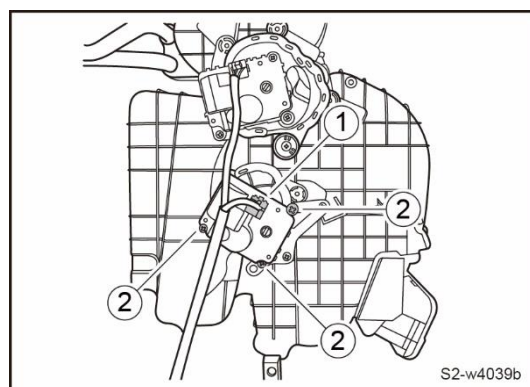


2. Install dashboard beam
3. Install main wiring harness assembly
4. Install ventilation cover plate assembly
5. Install front wiper arm assembly
6. Install dashboard assembly
7. Install front passenger's side air bag
8. Install central cover assembly
9. Install lower guard plate assembly of driver's side
10. Install combination meter
11. Install central left trim plate assembly
12. Install audio assembly
13. Install audio panel assembly
14. Install A/C controller assembly
15. Install glove box assembly
16. Install central right trim plate assembly
17. Install end cover of dashboard
18. Install upper trim plate assembly of A column
19. Install lower trim plate assembly of A column
20. Install threshold guard plate assembly of front door
21. Install combination switch assembly
22. Install jacketing of steering column
23. Install steering wheel assembly
24. Install driver's side air bag assembly
25. Install auxiliary dashboard assembly
26. Install front storage box assembly
27. Install saucer cover plate assembly
28. Install front extension plate
29. Fill refrigerant, refrigeration oil
30. Connect negative electrode of battery
31. Close engine hood cover

XII、Temperature Motor Assembly

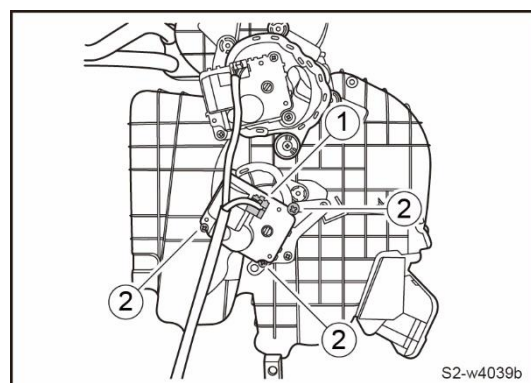
(I) Removal

1. Open engine hood cover
2. Disconnect negative electrode of battery Refer to “Disconnection and connection of battery cable”
3. Recycle refrigerant, refrigeration oil Refer to “Refrigerant, refrigeration oil”
4. Remove front extension plate Refer to “Auxiliary dashboard assembly”
5. Remove saucer cover plate assembly Refer to “Auxiliary dashboard assembly”
6. Remove front storage box assembly Refer to “Auxiliary dashboard assembly”
7. Remove auxiliary dashboard assembly Refer to “Auxiliary dashboard assembly”
8. Remove driver’s side air bag assembly Refer to “Driver’s side air bag assembly”
9. Remove steering wheel assembly Refer to “Steering wheel assembly”
10. Remove jacketing of steering column Refer to “Jacketing of steering column”
11. Remove combination switch assembly Refer to “Combination switch”
12. Remove threshold guard plate assembly of front door Refer to “Threshold guard plate assembly of front door”
13. Remove lower trim plate assembly of A column Refer to “Lower trim plate assembly of A column”
14. Remove upper trim plate assembly of A column Refer to “Upper trim plate assembly of A column”
15. Remove end cover of dashboard Refer to “End cover of dashboard”
16. Remove central right trim plate assembly Refer to “Central right trim plate assembly”
17. Remove glove box assembly Refer to “Glove box assembly”
18. Remove A/C controller assembly Refer to “A/C controller assembly”
19. Remove audio panel assembly Refer to “Audio panel assembly”
20. Remove audio assembly Refer to “Audio assembly”
21. Remove central left trim plate assembly Refer to “Central left trim plate assembly”
22. Remove combination meter Refer to “Combination meter”
23. Remove lower guard plate assembly of driver’s side Refer to “lower guard plate assembly of driver’s side”
24. Remove central cover assembly Refer to “Central cover assembly”
25. Remove front passenger’s side air bag Refer to “front passenger’s side air bag”
26. Remove dashboard assembly Refer to “Dashboard assembly”
27. Remove temperature motor assembly
 - 1). Disconnect wiring harness connector of temperature motor assembly;
 - 2). Remove 3 fixed bolts ② of temperature motor assembly;
 - 3). Take down temperature motor assembly;



(II) Installation

1. Install temperature motor assembly
 - 1). Place temperature motor assembly to installation position, and tighten 3 fixed bolts ②;
 - 2). Connect wiring harness connector ① of temperature motor assembly;

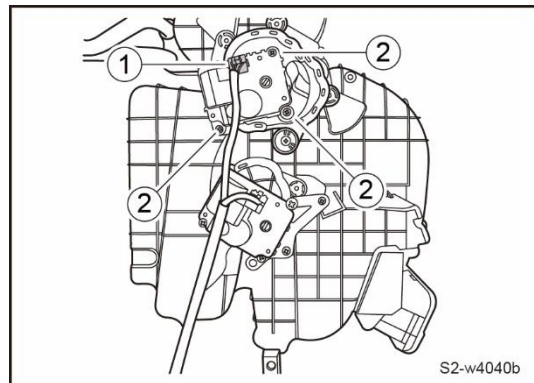


2. Install dashboard assembly
3. Install front passenger's side air bag
4. Install central cover assembly
5. Install lower guard plate assembly of driver's side
6. Install combination meter
7. Install central left trim plate assembly
8. Install audio assembly
9. Install audio panel assembly
10. Install A/C controller assembly
11. Install glove box assembly
12. Install central right trim plate assembly
13. Install end cover of dashboard
14. Install upper trim plate assembly of A column
15. Install lower trim plate assembly of A column
16. Install threshold guard plate assembly of front door
17. Install combination switch assembly
18. Install jacketing of steering column
19. Install steering wheel assembly
20. Install driver's side air bag assembly
21. Install auxiliary dashboard assembly
22. Install front storage box assembly
23. Install saucer cover plate assembly
24. Install front extension plate
25. Fill refrigerant, refrigeration oil
26. Connect negative electrode of battery
27. Close engine hood cover

XIII、Mode Motor

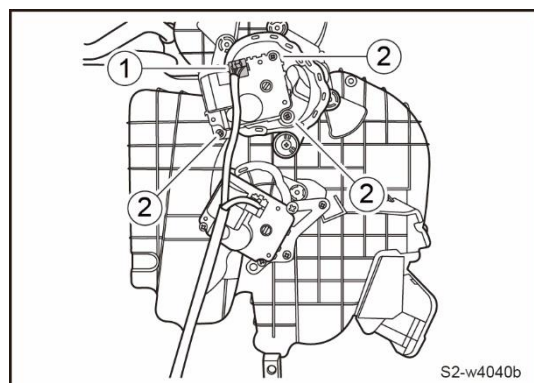
(I) Removal

1. Open engine hood cover
2. Disconnect negative electrode of battery Refer to “Disconnection and connection of battery cable”
3. Recycle refrigerant, refrigeration oil Refer to “Refrigerant, refrigeration oil”
4. Remove front extension plate Refer to “Auxiliary dashboard assembly”
5. Remove saucer cover plate assembly Refer to “Auxiliary dashboard assembly”
6. Remove front storage box assembly Refer to “Auxiliary dashboard assembly”
7. Remove auxiliary dashboard assembly Refer to “Auxiliary dashboard assembly”
8. Remove driver’s side air bag assembly Refer to “Driver’s side air bag assembly”
9. Remove steering wheel assembly Refer to “Steering wheel assembly”
10. Remove jacketing of steering column Refer to “Jacketing of steering column”
11. Remove combination switch assembly Refer to “Combination switch”
12. Remove threshold guard plate assembly of front door Refer to “Threshold guard plate assembly of front door”
13. Remove lower trim plate assembly of A column Refer to “Lower trim plate assembly of A column”
14. Remove upper trim plate assembly of A column Refer to “Upper trim plate assembly of A column”
15. Remove end cover of dashboard Refer to “End cover of dashboard”
16. Remove central right trim plate assembly Refer to “Central right trim plate assembly”
17. Remove glove box assembly Refer to “Glove box assembly”
18. Remove A/C controller assembly Refer to “A/C controller assembly”
19. Remove audio panel assembly Refer to “Audio panel assembly”
20. Remove audio assembly Refer to “Audio assembly”
21. Remove central left trim plate assembly Refer to “Central left trim plate assembly”
22. Remove combination meter Refer to “Combination meter”
23. Remove lower guard plate assembly of driver’s side Refer to “lower guard plate assembly of driver’s side”
24. Remove central cover assembly Refer to “Central cover assembly”
25. Remove front passenger’s side air bag Refer to “front passenger’s side air bag”
26. Remove dashboard assembly Refer to “Dashboard assembly”
27. Remove mode motor
 - 1). Disconnect wiring harness ① connector mode motor;
 - 2). Remove 3 fixed bolts ② of mode motor;
 - 3). Take out mode motor;



(II) Installation

1. Install mode motor
 - 1). Place mode motor to installation position, and tighten 3 fixed bolts ②;
 - 2). Connect wiring harness connector ① of mode



motor;

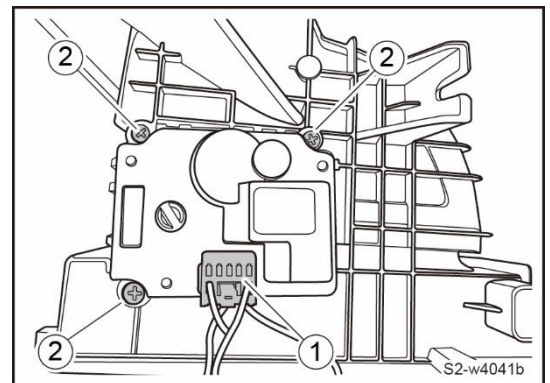
2. Install dashboard assembly
3. Install front passenger's side air bag
4. Install central cover assembly
5. Install lower guard plate assembly of driver's side
6. Install combination meter
7. Install central left trim plate assembly
8. Install audio assembly
9. Install audio panel assembly
10. Install A/C controller assembly
11. Install glove box assembly
12. Install central right trim plate assembly
13. Install end cover of dashboard
14. Install upper trim plate assembly of A column
15. Install lower trim plate assembly of A column
16. Install threshold guard plate assembly of front door
17. Install combination switch assembly
18. Install jacketing of steering column
19. Install steering wheel assembly
20. Install driver's side air bag assembly
21. Install auxiliary dashboard assembly
22. Install front storage box assembly
23. Install saucer cover plate assembly
24. Install front extension plate
25. Fill refrigerant, refrigeration oil
26. Connect negative electrode of battery
27. Close engine hood cover

XIV、Air Door Motor

(I) Removal

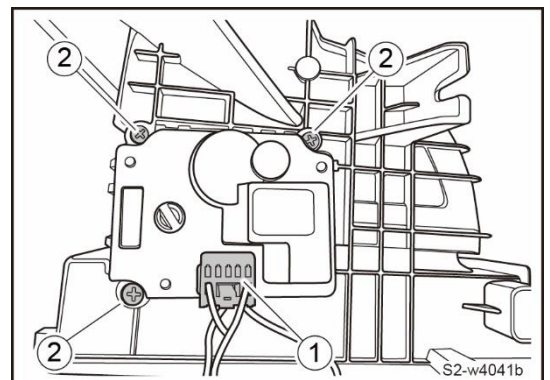
1. Open engine hood cover
2. Disconnect negative electrode of battery Refer to “Disconnection and connection of battery cable”
3. Recycle refrigerant, refrigeration oil Refer to “Refrigerant, refrigeration oil”
4. Remove front extension plate Refer to “Auxiliary dashboard assembly”
5. Remove saucer cover plate assembly Refer to “Auxiliary dashboard assembly”
6. Remove front storage box assembly Refer to “Auxiliary dashboard assembly”
7. Remove auxiliary dashboard assembly Refer to “Auxiliary dashboard assembly”
8. Remove driver’s side air bag assembly Refer to “Driver’s side air bag assembly”
9. Remove steering wheel assembly Refer to “Steering wheel assembly”
10. Remove jacketing of steering column Refer to “Jacketing of steering column”
11. Remove combination switch assembly Refer to “Combination switch”
12. Remove threshold guard plate assembly of front door Refer to “Threshold guard plate assembly of front door”
13. Remove lower trim plate assembly of A column Refer to “Lower trim plate assembly of A column”
14. Remove upper trim plate assembly of A column Refer to “Upper trim plate assembly of A column”
15. Remove end cover of dashboard Refer to “End cover of dashboard”
16. Remove central right trim plate assembly Refer to “Central right trim plate assembly”
17. Remove glove box assembly Refer to “Glove box assembly”
18. Remove A/C controller assembly Refer to “A/C controller assembly”
19. Remove audio panel assembly Refer to “Audio panel assembly”
20. Remove audio assembly Refer to “Audio assembly”
21. Remove central left trim plate assembly Refer to “Central left trim plate assembly”
22. Remove combination meter Refer to “Combination meter”
23. Remove lower guard plate assembly of driver’s side Refer to “lower guard plate assembly of driver’s side”
24. Remove central cover assembly Refer to “Central cover assembly”
25. Remove front passenger’s side air bag Refer to “front passenger’s side air bag”
26. Remove dashboard assembly Refer to “Dashboard assembly”
27. Remove air door motor

- 1). Disconnect wiring harness connector ① of air door motor;
- 2). Remove 3 fixed bolts ② of air door motor;
- 3). Take out air door motor;



(II) Installation

1. Install air door motor
 - 1). Place air door motor to installation position, and tighten 3 fixed bolts;
 - 2). Connect wiring harness connector ② of air door motor;

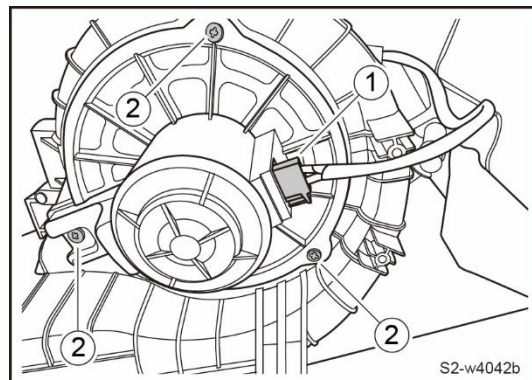


2. Install dashboard assembly
3. Install front passenger's side air bag
4. Install central cover assembly
5. Install lower guard plate assembly of driver's side
6. Install combination meter
7. Install central left trim plate assembly
8. Install audio assembly
9. Install audio panel assembly
10. Install A/C controller assembly
11. Install glove box assembly
12. Install central right trim plate assembly
13. Install end cover of dashboard
14. Install upper trim plate assembly of A column
15. Install lower trim plate assembly of A column
16. Install threshold guard plate assembly of front door
17. Install combination switch assembly
18. Install jacketing of steering column
19. Install steering wheel assembly
20. Install driver's side air bag assembly
21. Install auxiliary dashboard assembly
22. Install front storage box assembly
23. Install saucer cover plate assembly
24. Install front extension plate
25. Fill refrigerant, refrigeration oil
26. Connect negative electrode of battery
27. Close engine hood cover

XV、Blower Motor

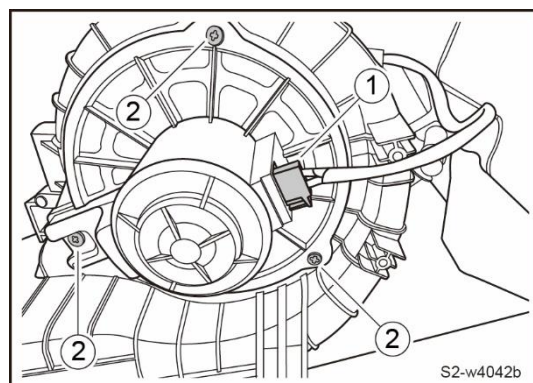
(I) Removal

1. Open engine hood cover
2. Disconnect negative electrode of battery Refer to “Disconnection and connection of battery electrode”
3. Remove glove box assembly Refer to “Glove box assembly”
4. Remove blower motor
 - 1). Disconnect wiring harness connector ① of blower motor;
 - 2). Remove 3 fixed bolts ② of blower motor;
 - 3). Take down blower motor from below



(II) Installation

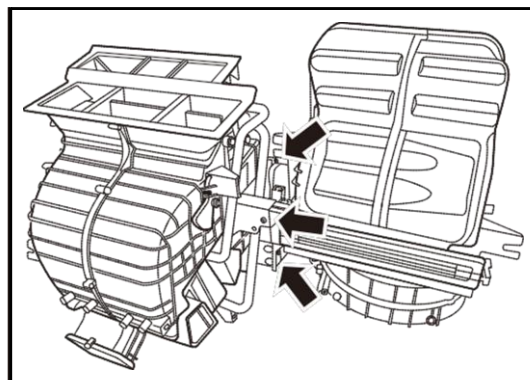
1. Install air door motor
 - 1). Place blower motor to installation position, and tighten 3 fixed bolts ②;
 - 2). Connect wiring harness connector ① of blower motor;
2. Install glove box
3. Connect negative electrode of battery
4. Close engine hood cover



XVI、Heater Core Assembly

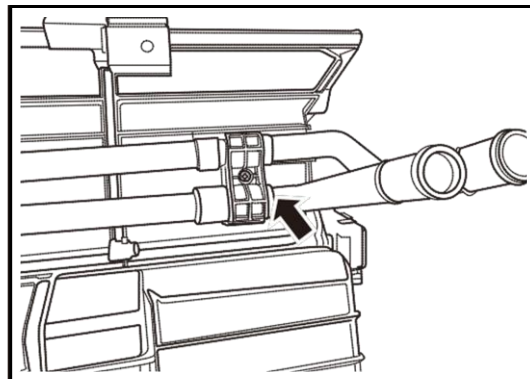
(I) Removal

1. Open engine hood cover
2. Disconnect negative electrode of battery Refer to “Disconnection and connection of battery cable”
3. Recycle refrigerant, refrigeration oil Refer to “Refrigerant, refrigeration oil”
4. Remove front extension plate Refer to “Auxiliary dashboard assembly”
5. Remove saucer cover plate assembly Refer to “Auxiliary dashboard assembly”
6. Remove front storage box assembly Refer to “Auxiliary dashboard assembly”
7. Remove auxiliary dashboard assembly Refer to “Auxiliary dashboard assembly”
8. Remove driver’s side air bag assembly Refer to “Driver’s side air bag assembly”
9. Remove steering wheel assembly Refer to “Steering wheel assembly”
10. Remove jacketing of steering column Refer to “Jacketing of steering column”
11. Remove combination switch assembly Refer to “Combination switch”
12. Remove threshold guard plate assembly of front door Refer to “Threshold guard plate assembly of front door”
13. Remove lower trim plate assembly of A column Refer to “Lower trim plate assembly of A column”
14. Remove upper trim plate assembly of A column Refer to “Upper trim plate assembly of A column”
15. Remove end cover of dashboard Refer to “End cover of dashboard”
16. Remove central right trim plate assembly Refer to “Central right trim plate assembly”
17. Remove glove box assembly Refer to “Glove box assembly”
18. Remove A/C controller assembly Refer to “A/C controller assembly”
19. Remove audio panel assembly Refer to “Audio panel assembly”
20. Remove audio assembly Refer to “Audio assembly”
21. Remove central left trim plate assembly Refer to “Central left trim plate assembly”
22. Remove combination meter Refer to “Combination meter”
23. Remove lower guard plate assembly of driver’s side Refer to “lower guard plate assembly of driver’s side”
24. Remove central cover assembly Refer to “Central cover assembly”
25. Remove front passenger’s side air bag Refer to “front passenger’s side air bag”
26. Remove dashboard assembly Refer to “Dashboard assembly”
27. Remove front wiper arm assembly Refer to “Front wiper arm assembly”
28. Remove ventilation cover plate assembly Refer to “Ventilation cover plate assembly”
29. Remove main wiring harness assembly Refer to “Main wiring harness assembly”
30. Remove dashboard beam Refer to “Dashboard beam”
31. Remove A/C host assembly
32. Remove blower housing assembly
 - 1). Remove 3 fixed bolts of blower housing assembly, and separate blower housing assembly;

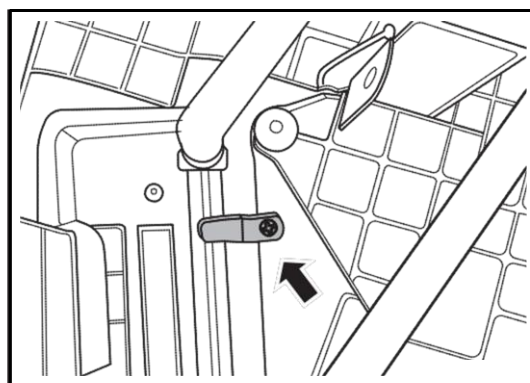


33. Remove heater core assembly

- 1). Remove fixed bolt of heater water pipe clamp, and take down water pipe clamp;

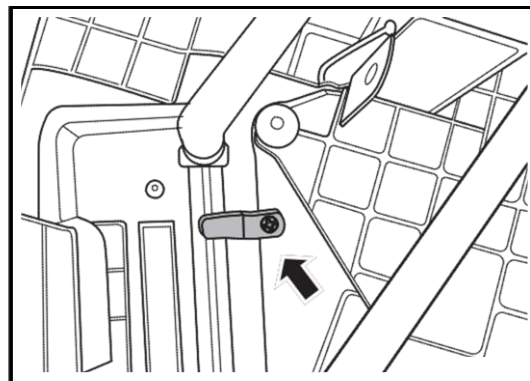


- 2). Remove tighten bolt of heater core assembly, and take down limit bracket;
- 3). Pull out heater;

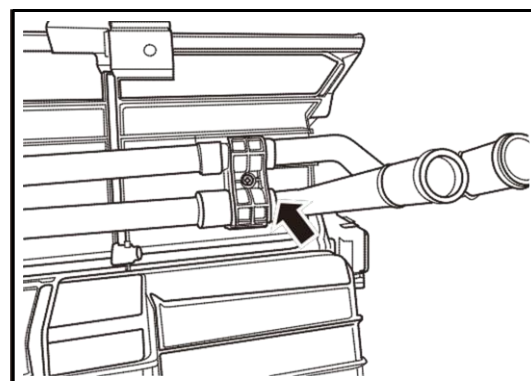
**(II) Installation**

1. Install heater core assembly

- 1). Place heater core assembly to installation position, install limit bracket and tighten bolt;

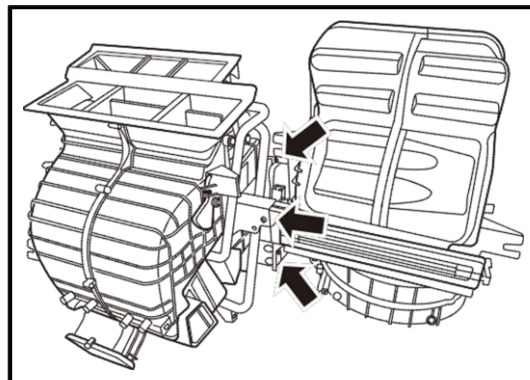


- 2). Install water pipe clamp and tighten bolt;



2. Install blower housing assembly

- 1). Install 3 fixed bolts of blower housing assembly;

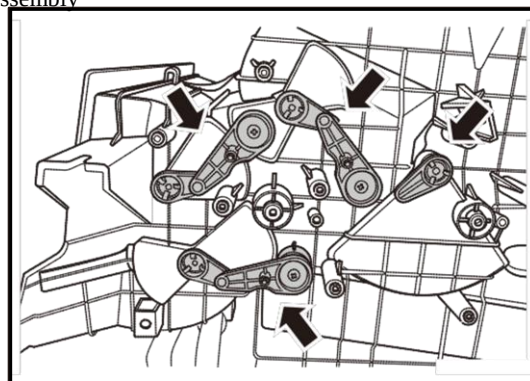


3. Install A/C host assembly
4. Install dashboard beam
5. Install main wiring harness assembly
6. Install ventilation cover plate assembly
7. Install front wiper arm assembly
8. Install dashboard assembly
9. Install front passenger's side air bag
10. Install central cover assembly
11. Install lower guard plate assembly of driver's side
12. Install combination meter
13. Install central left trim plate assembly
14. Install audio assembly
15. Install audio panel assembly
16. Install A/C controller assembly
17. Install glove box assembly
18. Install central right trim plate assembly
19. Install end cover of dashboard
20. Install upper trim plate assembly of A column
21. Install lower trim plate assembly of A column
22. Install threshold guard plate assembly of front door
23. Install combination switch assembly
24. Install jacketing of steering column
25. Install steering wheel assembly
26. Install driver's side air bag assembly
27. Install auxiliary dashboard assembly
28. Install front storage box assembly
29. Install saucer cover plate assembly
30. Install front extension plate
31. Fill refrigerant, refrigeration oil
32. Connect negative electrode of battery
33. Close engine hood cover

XVII、Evaporator Core Assembly

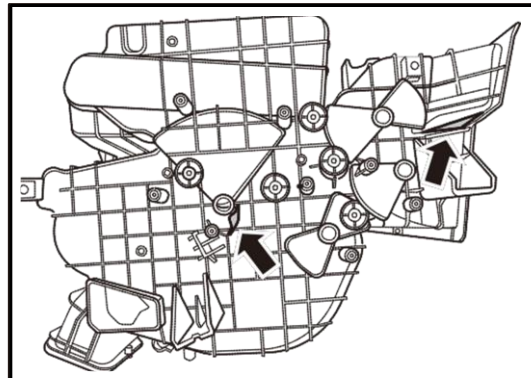
(I) Removal

1. Open engine hood cover
2. Disconnect negative electrode of battery Refer to “Disconnection and connection of battery cable”
3. Recycle refrigerant, refrigeration oil Refer to “Refrigerant, refrigeration oil”
4. Remove front extension plate Refer to “Auxiliary dashboard assembly”
5. Remove saucer cover plate assembly Refer to “Auxiliary dashboard assembly”
6. Remove front storage box assembly Refer to “Auxiliary dashboard assembly”
7. Remove auxiliary dashboard assembly Refer to “Auxiliary dashboard assembly”
8. Remove driver’s side air bag assembly Refer to “Driver’s side air bag assembly”
9. Remove steering wheel assembly Refer to “Steering wheel assembly”
10. Remove jacketing of steering column Refer to “Jacketing of steering column”
11. Remove combination switch assembly Refer to “Combination switch”
12. Remove threshold guard plate assembly of front door Refer to “Threshold guard plate assembly of front door”
13. Remove lower trim plate assembly of A column Refer to “Lower trim plate assembly of A column”
14. Remove upper trim plate assembly of A column Refer to “Upper trim plate assembly of A column”
15. Remove end cover of dashboard Refer to “End cover of dashboard”
16. Remove central right trim plate assembly Refer to “Central right trim plate assembly”
17. Remove glove box assembly Refer to “Glove box assembly”
18. Remove A/C controller assembly Refer to “A/C controller assembly”
19. Remove audio panel assembly Refer to “Audio panel assembly”
20. Remove audio assembly Refer to “Audio assembly”
21. Remove central left trim plate assembly Refer to “Central left trim plate assembly”
22. Remove combination meter Refer to “Combination meter”
23. Remove lower guard plate assembly of driver’s side Refer to “lower guard plate assembly of driver’s side”
24. Remove central cover assembly Refer to “Central cover assembly”
25. Remove front passenger’s side air bag Refer to “front passenger’s side air bag”
26. Remove dashboard assembly Refer to “Dashboard assembly”
27. Remove front wiper arm assembly Refer to “Front wiper arm assembly”
28. Remove ventilation cover plate assembly Refer to “Ventilation cover plate assembly”
29. Remove main wiring harness assembly Refer to “Main wiring harness assembly”
30. Remove dashboard beam Refer to “Dashboard beam”
31. Remove A/C host assembly
32. Remove mode motor Refer to “Mode motor”
33. Remove temperature motor assembly Refer to “Temperature motor assembly”
34. Remove evaporator core assembly
 - 1). Remove air door connecting rod;

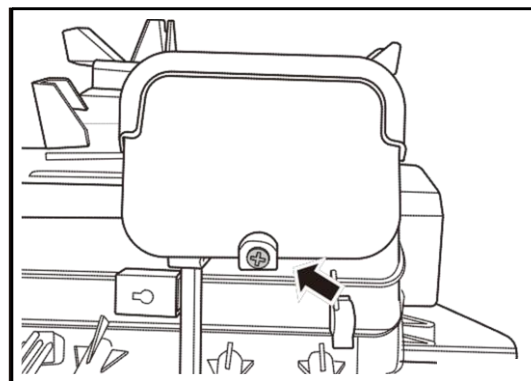


2). Remove 15 fixed bolts of left/right housing

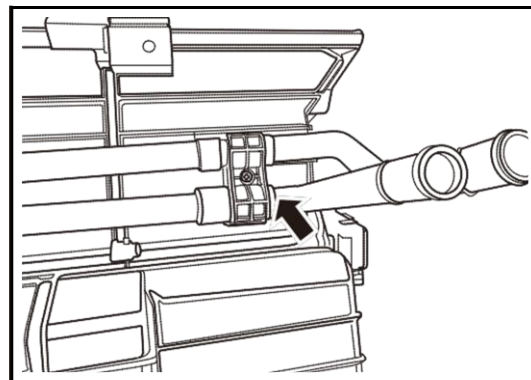
△ Caution Two bolts shown in the figure is hidden, please don't leave out!



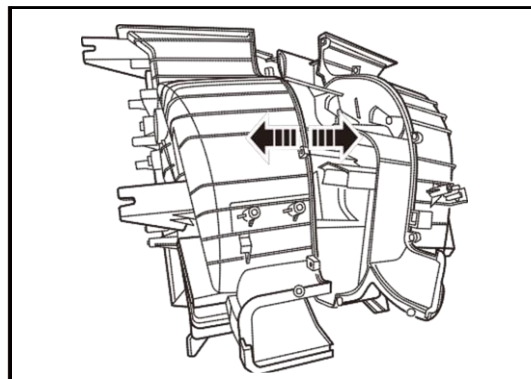
3). Remove fixed bolt of air duct guard plate, and take down air duct guard plate;



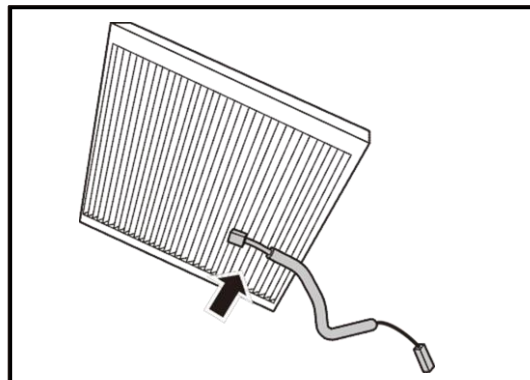
4). Remove fixed bolt of heater water pipe clamp, and take down water pipe clamp;



5). Separate left and right housing, and take down air duct;



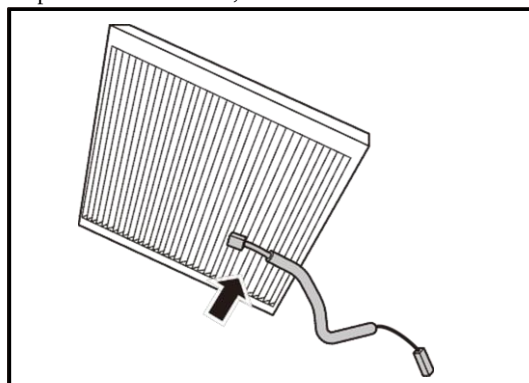
- 6). Pull out temperature sensor bulb;



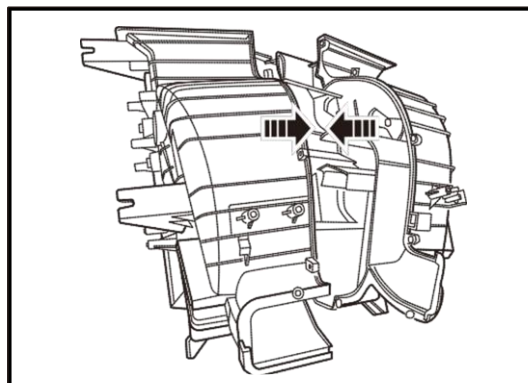
(II) Installation

1. Install evaporator core assembly

- 1). Place evaporator core assembly to installation position, and install temperature sensor bulb;

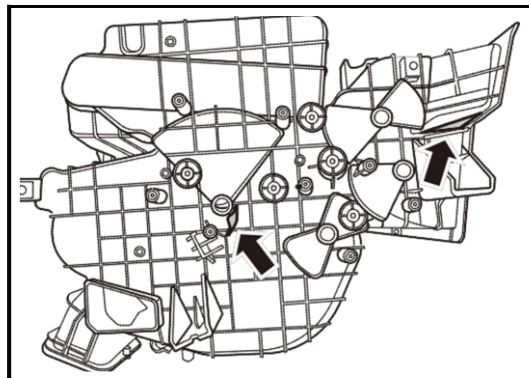


- 2). Install air duct assembly, and install left and right housing;

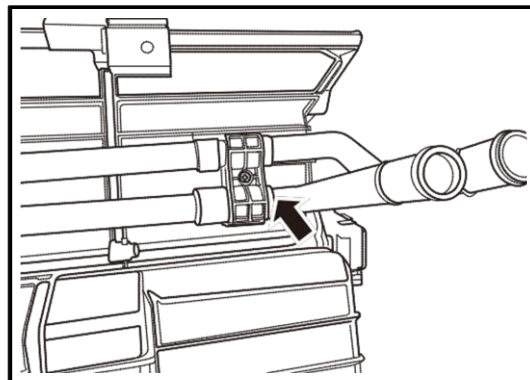


- 3). Install 15 fixed bolts of left and right housing;

△ Caution Two bolts shown in the figure is hidden, please don't leave out!

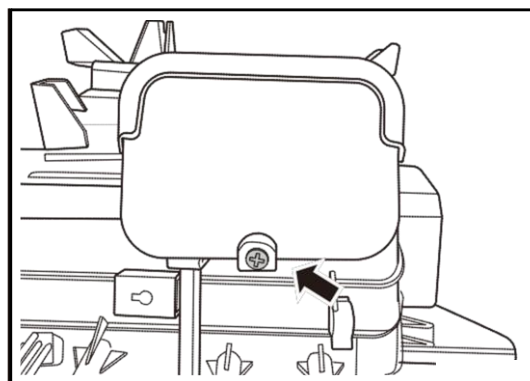


- 4). Install water pipe clamp, and tighten fixed bolt of heater water pipe clamp ;



- 5). Install air duct guard plate, tighten fixed bolt of air duct guard plate;

- 6). Install air duct connecting rod;

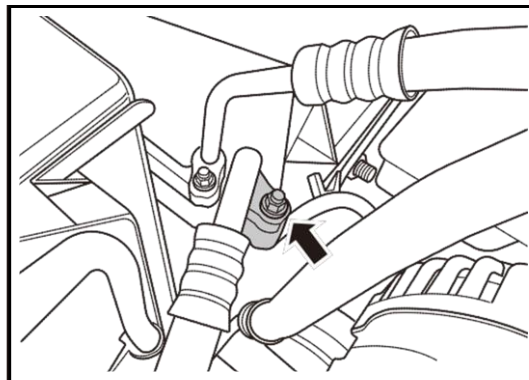


2. Install temperature motor assembly
3. Install mode motor
4. Install A/C host assembly
5. Install dashboard beam
6. Install main wiring harness assembly
7. Install ventilation cover plate assembly
8. Install front wiper arm assembly
9. Install dashboard assembly
10. Install front passenger's side air bag
11. Install central cover assembly
12. Install lower guard plate assembly of driver's side
13. Install combination meter
14. Install central left trim plate assembly
15. Install audio assembly
16. Install audio panel assembly
17. Install A/C controller assembly
18. Install glove box assembly
19. Install central right trim plate assembly
20. Install end cover of dashboard
21. Install upper trim plate assembly of A column
22. Install lower trim plate assembly of A column
23. Install threshold guard plate assembly of front door
24. Install combination switch assembly
25. Install jacketing of steering column
26. Install steering wheel assembly
27. Install driver's side air bag assembly
28. Install auxiliary dashboard assembly
29. Install front storage box assembly
30. Install saucer cover plate assembly
31. Install front extension plate
32. Fill refrigerant, refrigeration oil
33. Connect negative electrode of battery
34. Close engine hood cover

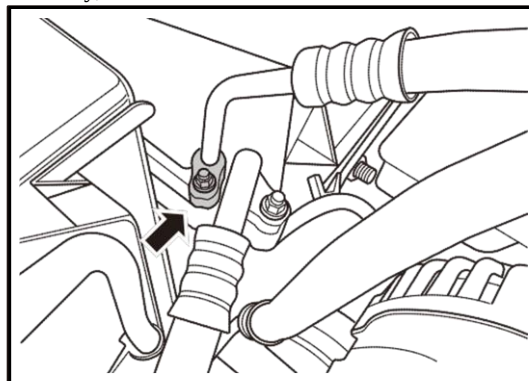
XVIII、Condenser

(I) Removal

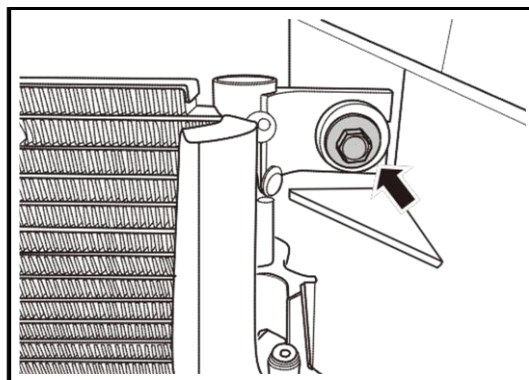
1. Open engine hood cover
2. Disconnect negative electrode of battery Refer to “Disconnection and connection of battery cable”
3. Recycle refrigerant, refrigeration oil Refer to “Refrigerant, refrigeration oil”
4. Discharge engine coolant Refer to “Replacement of engine coolant”
5. Remove upper cover plate of front bumper Refer to “Upper cover plate of front bumper”
6. Remove front bumper assembly Refer to “Front bumper”
7. Remove ventilation hose of radiator Refer to “Ventilation hose of radiator”
8. Remove left front hood of engine Refer to “Left front hood of engine”
9. Remove right front hood of engine Refer to “Right front hood of engine”
10. Remove radiator fan assembly Refer to “radiator fan assembly”
11. Remove radiator assembly Refer to “Radiator assembly”
12. Remove condenser
 - 1). Remove fixed nut of exhausting pipe assembly and condenser assembly;



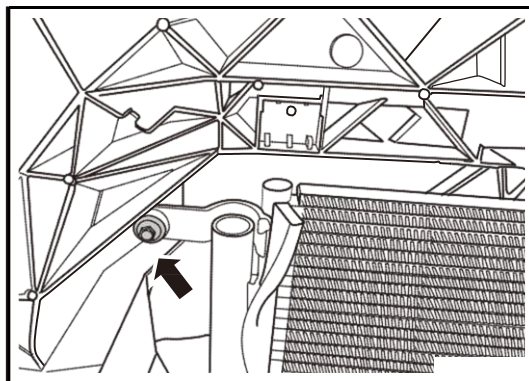
- 2). Remove fixed nut of pipe and expansion valve assembly and condenser assembly;



- 3). Remove fixed bolt of right side of condenser and front module;



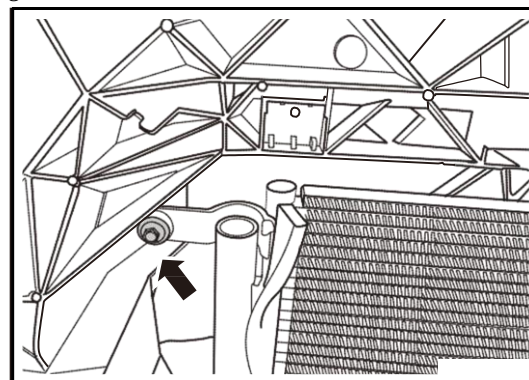
- 4). Remove fixed bolt of left side of condenser and front module;
- 5). Take out condenser assembly;



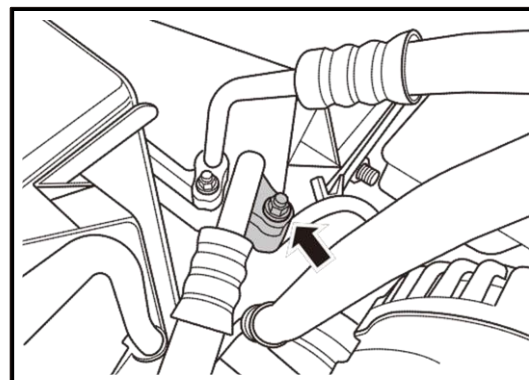
(II) Installation

1. Install condenser

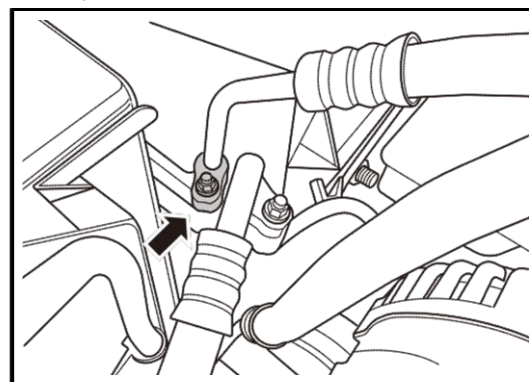
- 1). Place condenser assembly to installation position, and tighten left and right installation bolt of condenser;



- 2). Tighten fixed nut of exhausting pipe assembly and condenser assembly;



- 3). Tighten fixed nut of pipe and expansion valve assembly and condenser assembly;

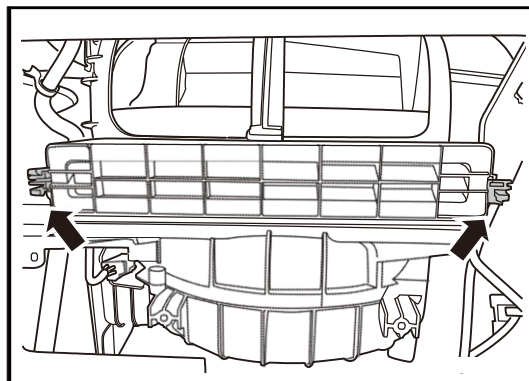


2. Install radiator assembly
3. Install radiator fan assembly
4. Install engine left front hood
5. Install engine right front hood
6. Install ventilation hose of radiator
7. Install front bumper assembly
8. Install upper cover plate of front bumper
9. Fill engine coolant
10. Fill refrigerant, refrigeration oil
11. Connect negative electrode of battery
12. Close engine hood cover

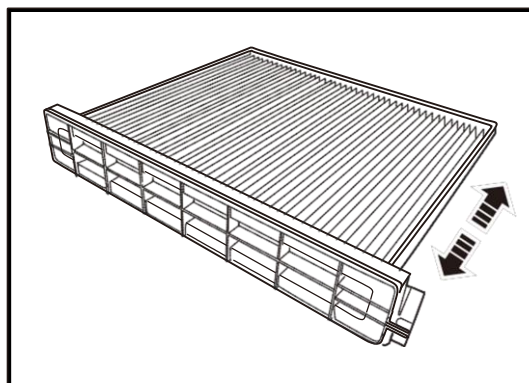
XIX、Air Filter

(I) Removal

1. Remove glove box assembly Refer to “Glove box assembly”
2. Remove air filter
 - 1). Remove buckles of air filter cover, and remove air filter cover;

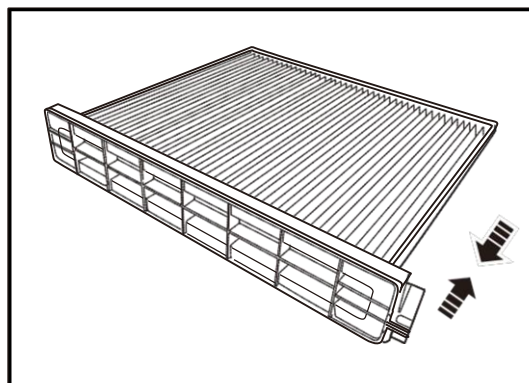


- 2). Take air filter out from air filter cover;



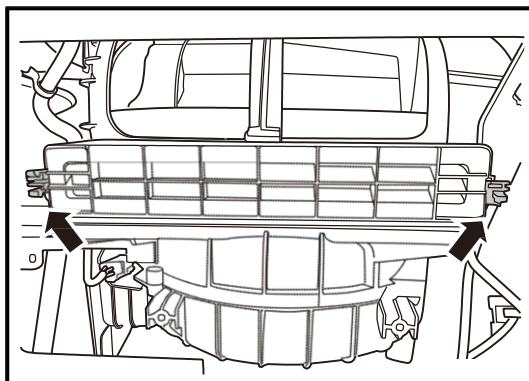
(II) Installation

1. Install air filter
 - 1). Install air filter into air filter cover;



- 2). Install air filter cover;

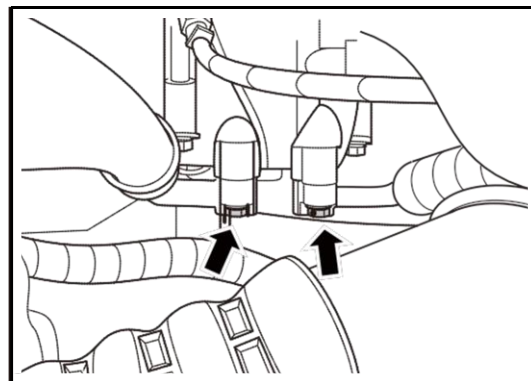
2. Install glove box assembly



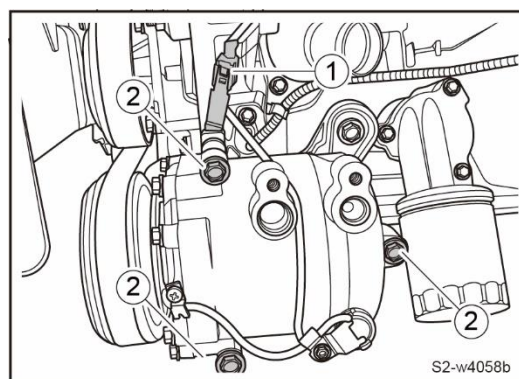
XX、Compressor Assembly

(I) Removal

1. Open engine hood cover
2. Disconnect negative electrode of battery Refer to “Disconnection and connection of battery electrode”
3. Recycle refrigerant, refrigeration oil Refer to “Refrigerant, refrigeration oil”
4. Remove engine right front hood cover Refer to “Engine front hood cover”
5. Remove generator belt Refer to “Generator belt”
6. Remove compressor assembly
 - 1). Remove fixed bolt connected compressor and pipe and expansion valve assembly;
 - 2). Remove fixed bolt connected compressor and exhausting pipe assembly;

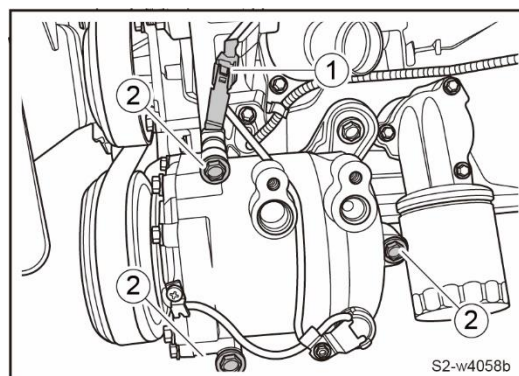


- 3). Disconnect wiring harness connector ① of compressor assembly;
- 4). Remove compressor assembly and 3 fixed bolts ②, and take down compressor assembly;

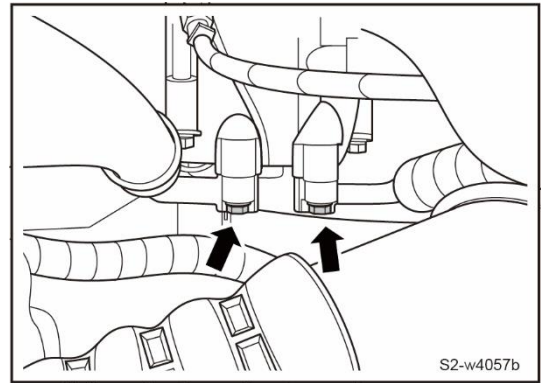


(II) Installation

1. Install compressor assembly
 - 1). Place compressor assembly to installation position, and tighten 3 fixed bolts ②;
 - 2). Connect wiring harness connector ① of compressor assembly;



- 3). Install fixed bolt connected compressor and pipe and expansion valve assembly;
- 4). Install fixed bolt connected compressor and exhausting pipe assembly;

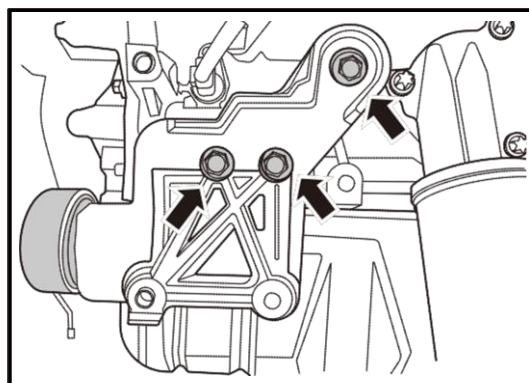


2. Install generator belt
3. Install right front hood cover of engine
4. Fill refrigerant, refrigeration oil
5. Connect negative electrode of battery
6. Close engine hood cover

XXI、Compressor Bracket

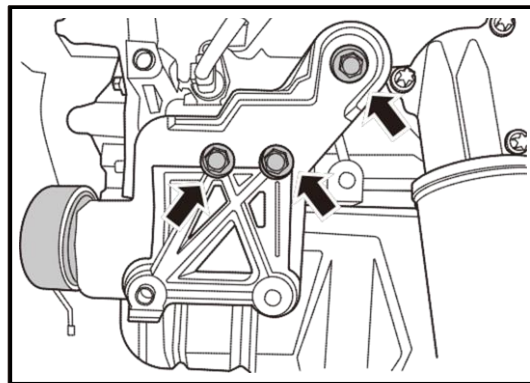
(I) Removal

1. Open engine hood cover
2. Disconnect negative electrode of battery Refer to “Disconnection and connection of battery electrode”
3. Recycle refrigerant, refrigeration oil Refer to “Refrigerant, refrigeration oil”
4. Remove engine right front hood cover Refer to “Engine front hood cover”
5. Remove generator belt Refer to “Generator belt”
6. Remove compressor assembly
7. Remove compressor bracket
 - 1). Remove 3 fixed bolts of compressor bracket and engine, and take down compressor bracket and idler pulley;
 - 2). Remove fixed bolt, and separate compressor bracket and idler pulley;



(II) Installation

1. Install compressor bracket
 - 1). Place compressor bracket to installation position, and tighten 3 fixed bolts;
 - 2). Install idler pulley, and tighten fixed bolt;

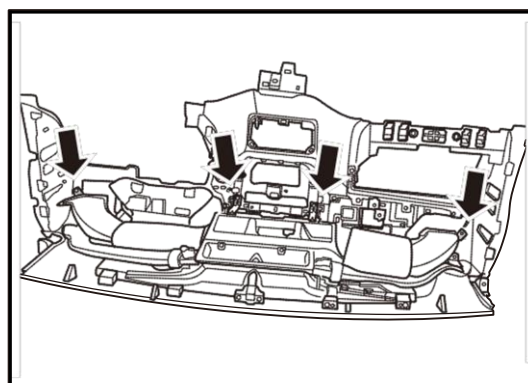


2. Install compressor assembly
3. Install generator belt
4. Install right front hood cover of engine
5. Fill refrigerant, refrigeration oil
6. Connect negative electrode of battery
7. Close engine hood cover

XXII、Blowing Face Air Duct Assembly

(I) Removal

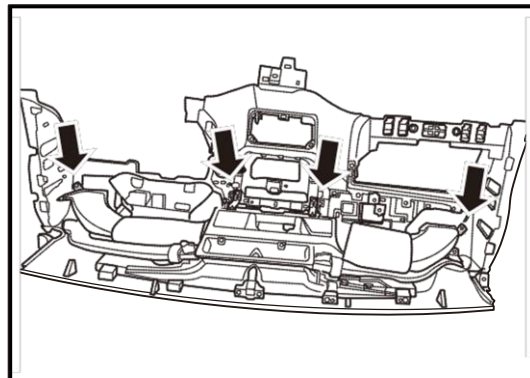
1. Open engine hood cover
2. Disconnect negative electrode of battery Refer to “Disconnection and connection of battery cable”
3. Remove front extension plate Refer to “Auxiliary dashboard assembly”
4. Remove saucer cover plate assembly Refer to “Auxiliary dashboard assembly”
5. Remove front storage box assembly Refer to “Auxiliary dashboard assembly”
6. Remove auxiliary dashboard assembly Refer to “Auxiliary dashboard assembly”
7. Remove driver’s side air bag assembly Refer to “Driver’s side air bag assembly”
8. Remove steering wheel assembly Refer to “Steering wheel assembly”
9. Remove jacketing of steering column Refer to “Jacketing of steering column”
10. Remove combination switch assembly Refer to “Combination switch”
11. Remove threshold guard plate assembly of front door Refer to “Threshold guard plate assembly of front door”
12. Remove lower trim plate assembly of A column Refer to “Lower trim plate assembly of A column”
13. Remove upper trim plate assembly of A column Refer to “Upper trim plate assembly of A column”
14. Remove end cover of dashboard Refer to “End cover of dashboard”
15. Remove central right trim plate assembly Refer to “Central right trim plate assembly”
16. Remove glove box assembly Refer to “Glove box assembly”
17. Remove A/C controller assembly Refer to “A/C controller assembly”
18. Remove audio panel assembly Refer to “Audio panel assembly”
19. Remove audio assembly Refer to “Audio assembly”
20. Remove central left trim plate assembly Refer to “Central left trim plate assembly”
21. Remove combination meter Refer to “Combination meter”
22. Remove lower guard plate assembly of driver’s side Refer to “lower guard plate assembly of driver’s side”
23. Remove central cover assembly Refer to “Central cover assembly”
24. Remove front passenger’s side air bag Refer to “front passenger’s side air bag”
25. Remove dashboard assembly Refer to “Dashboard assembly”
26. Remove blowing face air duct assembly
 - 1). Remove 4 fixed bolts of blowing face air duct assembly and dashboard;
 - 2). Take down blowing face air duct assembly;



(II) Installation

1. Install blowing facing air duct assembly

- 1). Place blowing face air duct assembly to installation position, and tighten 4 fixed bolts;

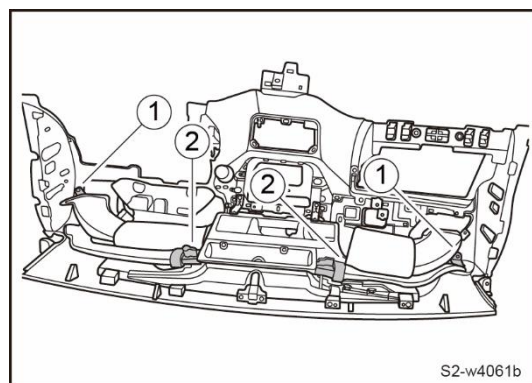


2. Install dashboard assembly
3. Install front passenger's side air bag
4. Install central cover assembly
5. Install lower guard plate assembly of driver's side
6. Install combination meter
7. Install central left trim plate assembly
8. Install audio assembly
9. Install audio panel assembly
10. Install A/C controller assembly
11. Install glove box assembly
12. Install central right trim plate assembly
13. Install end cover of dashboard
14. Install upper trim plate assembly of A column
15. Install lower trim plate assembly of A column
16. Install threshold guard plate assembly of front door
17. Install combination switch assembly
18. Install jacketing of steering column
19. Install steering wheel assembly
20. Install driver's side air bag assembly
21. Install auxiliary dashboard assembly
22. Install front storage box assembly
23. Install saucer cover plate assembly
24. Install front extension plate
25. Connect negative electrode of battery
26. Close engine hood cover

XXIII、Defrost Air Pipe Assembly of Left/Right Side

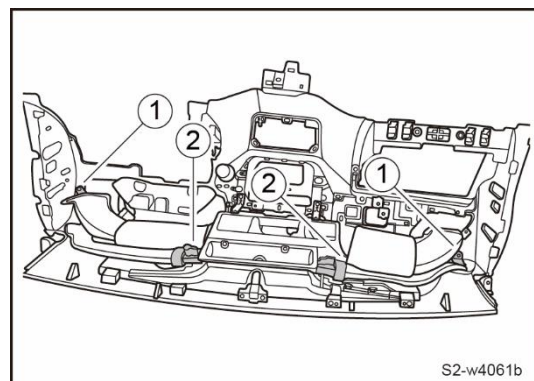
(I) Removal

1. Open engine hood cover
2. Disconnect negative electrode of battery Refer to “Disconnection and connection of battery cable”
3. Remove front extension plate Refer to “Auxiliary dashboard assembly”
4. Remove saucer cover plate assembly Refer to “Auxiliary dashboard assembly”
5. Remove front storage box assembly Refer to “Auxiliary dashboard assembly”
6. Remove auxiliary dashboard assembly Refer to “Auxiliary dashboard assembly”
7. Remove driver’s side air bag assembly Refer to “Driver’s side air bag assembly”
8. Remove steering wheel assembly Refer to “Steering wheel assembly”
9. Remove jacketing of steering column Refer to “Jacketing of steering column”
10. Remove combination switch assembly Refer to “Combination switch”
11. Remove threshold guard plate assembly of front door Refer to “Threshold guard plate assembly of front door”
12. Remove lower trim plate assembly of A column Refer to “Lower trim plate assembly of A column”
13. Remove upper trim plate assembly of A column Refer to “Upper trim plate assembly of A column”
14. Remove end cover of dashboard Refer to “End cover of dashboard”
15. Remove central right trim plate assembly Refer to “Central right trim plate assembly”
16. Remove glove box assembly Refer to “Glove box assembly”
17. Remove A/C controller assembly Refer to “A/C controller assembly”
18. Remove audio panel assembly Refer to “Audio panel assembly”
19. Remove audio assembly Refer to “Audio assembly”
20. Remove central left trim plate assembly Refer to “Central left trim plate assembly”
21. Remove combination meter Refer to “Combination meter”
22. Remove lower guard plate assembly of driver’s side Refer to “lower guard plate assembly of driver’s side”
23. Remove central cover assembly Refer to “Central cover assembly”
24. Remove front passenger’s side air bag Refer to “front passenger’s side air bag”
25. Remove dashboard assembly Refer to “Dashboard assembly”
26. Remove defrost air pipe assembly of left/right side
 - 1). Remove fixed bolt ① of defrost air pipe assembly of left/right side and dashboard;
 - 2). Disconnect connection ② of defrost air pipe assembly of left/right side and front defrost air pipe assembly;
 - 3). Take down defrost air pipe assembly of left/right side;



(II) Installation

1. Install defrost air pipe assembly of left/right side
 - 1). Connect defrost air pipe assembly of left/right side and front defrost air pipe assembly ②;
 - 2). Connect fixed bolt ① of defrost air pipe assembly of left/right side and dashboard;

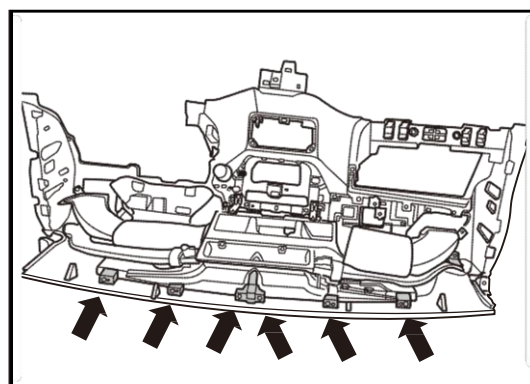


2. Install dashboard assembly
3. Install front passenger's side air bag
4. Install central cover assembly
5. Install lower guard plate assembly of driver's side
6. Install combination meter
7. Install central left trim plate assembly
8. Install audio assembly
9. Install audio panel assembly
10. Install A/C controller assembly
11. Install glove box assembly
12. Install central right trim plate assembly
13. Install end cover of dashboard
14. Install upper trim plate assembly of A column
15. Install lower trim plate assembly of A column
16. Install threshold guard plate assembly of front door
17. Install combination switch assembly
18. Install jacketing of steering column
19. Install steering wheel assembly
20. Install driver's side air bag assembly
21. Install auxiliary dashboard assembly
22. Install front storage box assembly
23. Install saucer cover plate assembly
24. Install front extension plate
25. Connect negative electrode of battery
26. Close engine hood cover

XXIV、Front Defrost Air Pipe Assembly

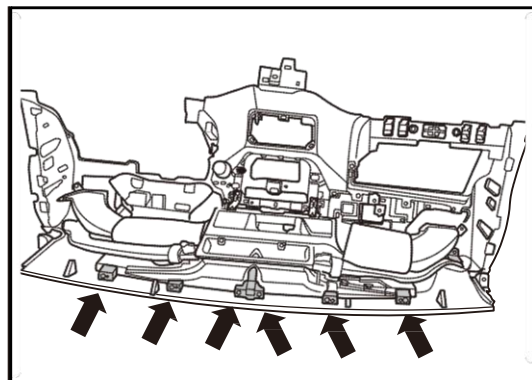
(I) Removal

1. Open engine hood cover
2. Disconnect negative electrode of battery Refer to “Disconnection and connection of battery cable”
3. Remove front extension plate Refer to “Auxiliary dashboard assembly”
4. Remove saucer cover plate assembly Refer to “Auxiliary dashboard assembly”
5. Remove front storage box assembly Refer to “Auxiliary dashboard assembly”
6. Remove auxiliary dashboard assembly Refer to “Auxiliary dashboard assembly”
7. Remove driver’s side air bag assembly Refer to “Driver’s side air bag assembly”
8. Remove steering wheel assembly Refer to “Steering wheel assembly”
9. Remove jacketing of steering column Refer to “Jacketing of steering column”
10. Remove combination switch assembly Refer to “Combination switch”
11. Remove threshold guard plate assembly of front door Refer to “Threshold guard plate assembly of front door”
12. Remove lower trim plate assembly of A column Refer to “Lower trim plate assembly of A column”
13. Remove upper trim plate assembly of A column Refer to “Upper trim plate assembly of A column”
14. Remove end cover of dashboard Refer to “End cover of dashboard”
15. Remove central right trim plate assembly Refer to “Central right trim plate assembly”
16. Remove glove box assembly Refer to “Glove box assembly”
17. Remove A/C controller assembly Refer to “A/C controller assembly”
18. Remove audio panel assembly Refer to “Audio panel assembly”
19. Remove audio assembly Refer to “Audio assembly”
20. Remove central left trim plate assembly Refer to “Central left trim plate assembly”
21. Remove combination meter Refer to “Combination meter”
22. Remove lower guard plate assembly of driver’s side Refer to “lower guard plate assembly of driver’s side”
23. Remove central cover assembly Refer to “Central cover assembly”
24. Remove front passenger’s side air bag Refer to “front passenger’s side air bag”
25. Remove dashboard assembly Refer to “Dashboard assembly”
26. Remove defrost air pipe assembly of left/right side Refer to “Defrost air pipe assembly of left/right side”
27. Remove front defrost air pipe assembly
 - 1). Remove 6 fixed bolts of front defrost air pipe assembly and dashboard;
 - 2). Take down front defrost air pipe assembly;



(II) Installation**1. Install front defrost air pipe assembly**

- 1). Place front defrost air pipe assembly to installation position, and tighten 6 fixed bolts of front defrost air pipe assembly and dashboard;



2. Install left/right defrost air pipe assembly
3. Install dashboard assembly
4. Install front passenger's side air bag
5. Install central cover assembly
6. Install lower guard plate assembly of driver's side
7. Install combination meter
8. Install central left trim plate assembly
9. Install audio assembly
10. Install audio panel assembly
11. Install A/C controller assembly
12. Install glove box assembly
13. Install central right trim plate assembly
14. Install end cover of dashboard
15. Install upper trim plate assembly of A column
16. Install lower trim plate assembly of A column
17. Install threshold guard plate assembly of front door
18. Install combination switch assembly
19. Install jacketing of steering column
20. Install steering wheel assembly
21. Install driver's side air bag assembly
22. Install auxiliary dashboard assembly
23. Install front storage box assembly
24. Install saucer cover plate assembly
25. Install front extension plate
26. Connect negative electrode of battery
27. Close engine hood cover

Safety Auxiliary System

I、Summary

(I) Summary of Safety Auxiliary System

Generally, auxiliary restriction system indicates whole safety airbag system, and there are “SRS” marks on trim cover of airbag or where there are airbags;

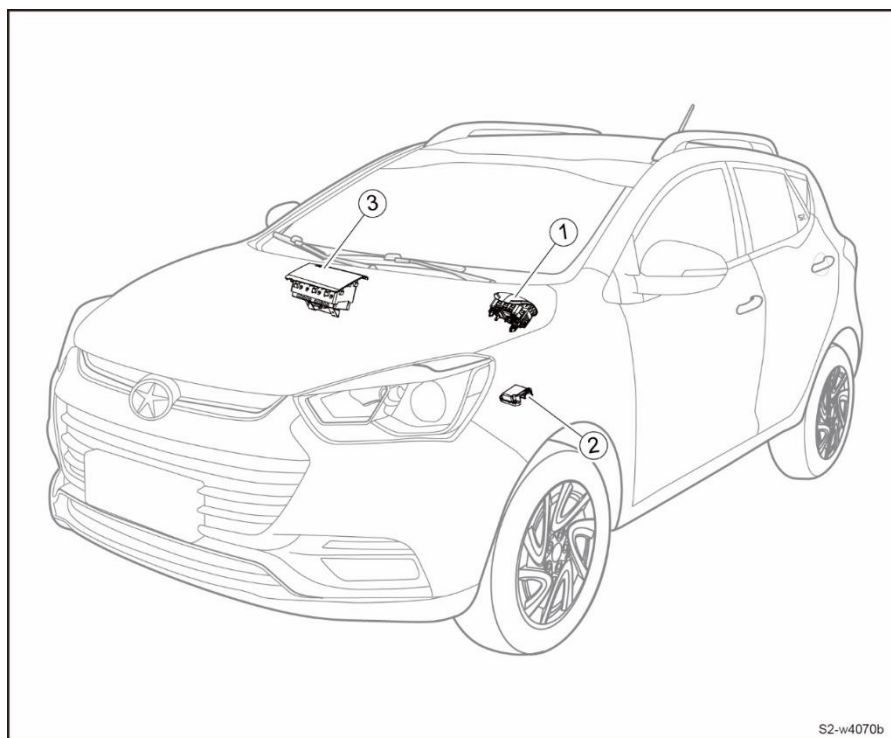
1、Driver Airbag - DAB : Directly protect driver's upper body when serious front collision happened, and it can stop driver from moving forward in some extent. Usually this kind of airbag is installed inside steering wheel, and trim cover of DAB is horn cover on steering wheel;

2、Passenger Airbag - PAB : Directly protect passenger's upper body when serious front collision happened, and it can stop driver from moving forward in some extent. Usually this kind of airbag is installed inside dashboard of front passenger's side, and there are visible type and hidden type;

3、Side Airbag - SAB : Mainly supply extra protection to front driver and passenger. Protect chest of front driver and passenger and hip of person in vehicle collision side.

△Caution When driving, please fasten safety belt as required. Protection effect will not be obvious when only using airbag, and in some sense, using airbag without main restriction system (safety belt) will cause passenger more harm. Safety airbag is auxiliary device of safety belt, and can't replace safety belt.

Component Position

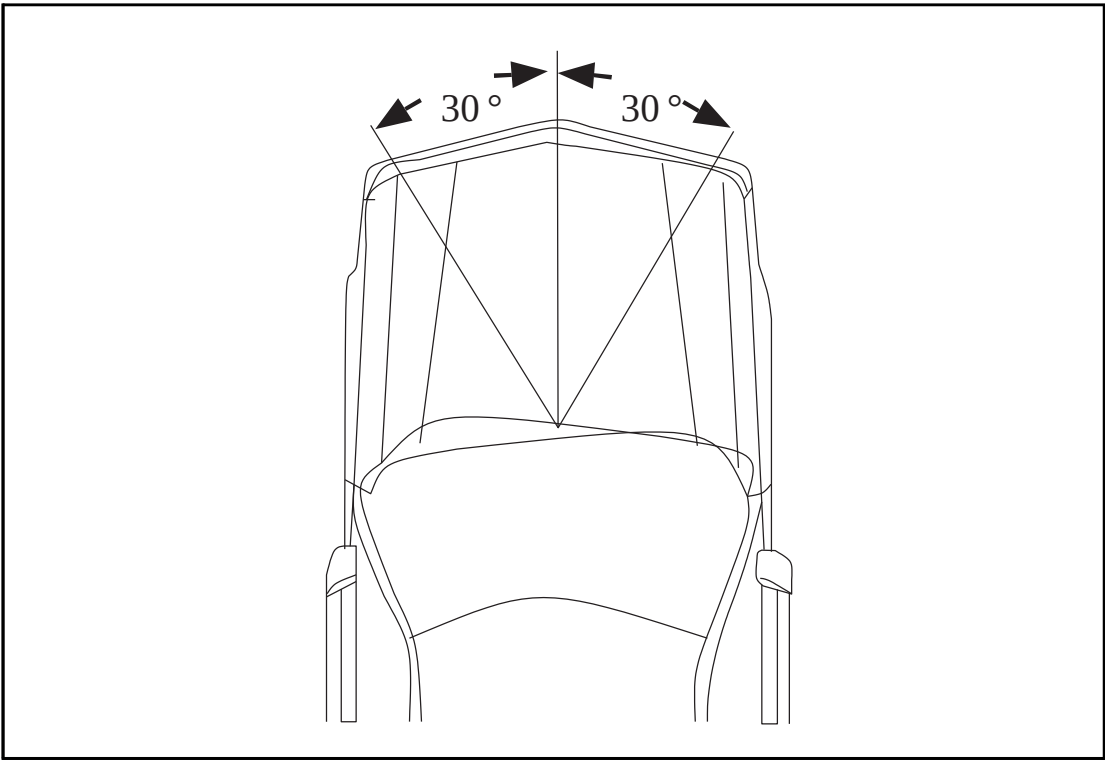


- 1. Air bag assembly of driver
- 2. Airbag controller

- 3. Airbag assembly of front passenger

(II) Principle of Airbag System

Operation Condition of Airbag



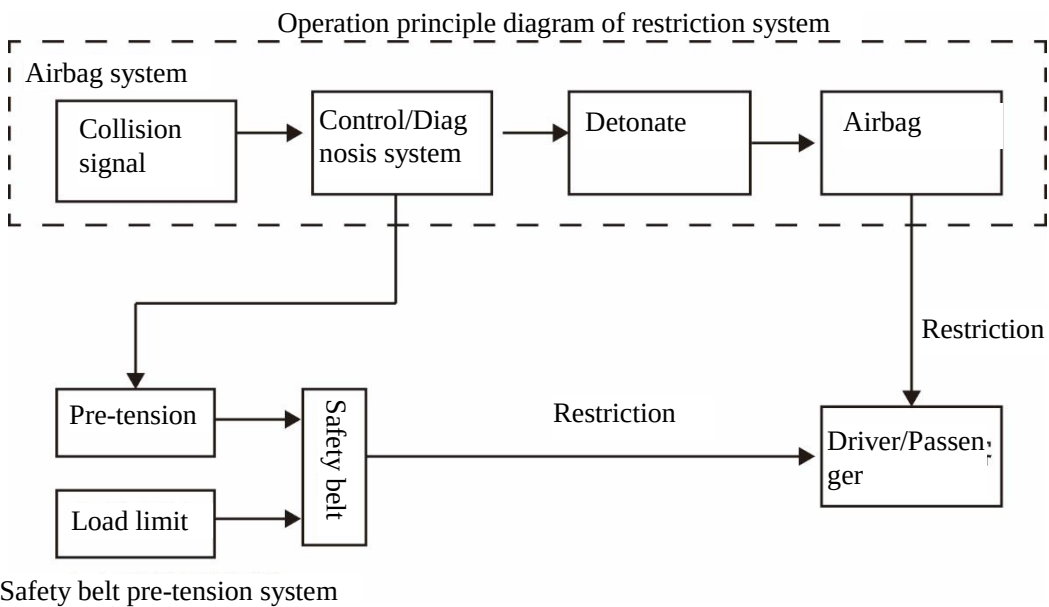
Front impact with enough strong impact force happened in the area of 30° range of vehicle centerline can make airbag work.

Operating Principle of Airbag System

When vehicle happened collision, collision between vehicle and obstruction is called first collision, which can cause vehicle speed decrease suddenly; collision between passenger and inner structure of vehicle is called second collision. Before passenger in vehicle and structure component of vehicle happened second collision, rapidly insert airbag full of air between passenger and inner structure component of vehicle, and absorb kinetic energy of passenger by airbag breathability and exhausting throttling effect, and this can slow down violent impact and separate passenger and inner structure component to protect passenger.

Airbag, seat and safety belt constitute vehicle restriction system.

Operation Principle Diagram of Restriction System



(III) Airbag Control Module (ACU) Function

1. Sense vehicle collision;
2. Detonate airbag of driver's side and passenger's side;
3. Detonate pre-tension type safety belt of driver's side and passenger's side;
4. Monitor working condition of airbag system;
5. Report state of airbag system by warning indicating light: ready or fault;
6. Diagnose and maintain airbag system by serial diagnosis communication port;
7. After collision happened, records related collision information data and working state of airbag all components;
8. After collision happened, transmits collision signal to ETACS module, engine ECU module. ETACS module open locked door to be convenient to escape; engine ECU module cuts off fuel-way to prevent fire;

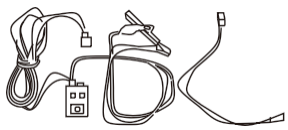
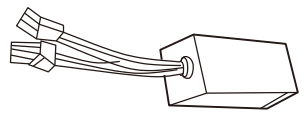
(IV) Maintenance Note

△Note During maintaining, it may cause airbag system be denoted accidentally and lead to serious accident if don't operate according to right procedure. Fault during maintenance may cause airbag can't be denoted normally when needed and cause serious accident.

△Note Before maintaining (including removal/installation/detection or replacement of components etc.), must read the following instructions carefully, and operate according to right procedure in service manual.

1. Don't separate driver's side airbag assembly and passenger's side airbag assembly etc. airbag components;
2. Don't maintain any component as shown below, only replace these components;
 - 1) Driver's side airbag;
 - 2) Passenger's side airbag;
 - 3) Airbag control module;
3. Don't expose airbag to high temperature or nearby fire;
4. Immediately clean with dry cloth if there are butter, detergent, oil or water;
5. Don't drop airbag. Don't use dropped airbag;
6. Only can obtain original packaging component from authorized dealers;
7. Place airbag right side upward to steady position after removing. Don't place any goods on it;
8. Confirm whether number of replaced component is right. Don't use other vehicle component to be substitute;
9. Even in the condition of slight collision accident but airbag not denoted, must check backing strap surface and airbag sensor. If there is hollow, crack or deformation, please replace new airbag assembly;
10. Must first deal with airbag before throwing vehicle or airbag;
11. Inflating device will become very hot after airbag denoted, and should deal after it cooling down naturally. Don't use water to cool down;
12. Don't measure resistance of airbag module circuit, which may cause airbag denoted;

(V) Special Tool List

No.	Tool No.	Tool Name	Tool Diagram	Use
1		Denoted tool		Denote airbag
2		Diagnosis inspector		Wiring harness inspector for module
3		Simulator		Simulator connector to check resistance of wiring harness

II、Troubleshooting

(I) Troubleshooting of Airbag System

When turning ignition switch to “ON”, airbag indicating light on dashboard flicker several seconds and then turns off, which indicates airbag system is in normal state. When turning ignition switch to “ON”, airbag indicating light is not on or always on, which indicates there is fault in airbag system. Use special fault diagnosis to diagnose for further analysis.

1) Use diagnosis device to read fault code;

2) Maintain according to fault code;

3) Clear fault code by diagnosis device;

△ Note Must use diagnosis device to clear fault code stored in system after fault is removed.

△ Note Don't use other electrical test device to test any circuit of SRS system except explanatory operation in this manual. Don't try to maintain, connect or change SRS wiring harness, if wiring harness damaged, please replace new wiring harness. Keep grounding point clean.

(II) Maintenance of Safety Airbag System

1. If safety airbag not denoted when vehicle happens accident in low speed/side impact/rollover, should inspect the following items :

- (1). Check whether there is dent, crack or deformation in ACU housing and installation bracket;
- (2). Check whether connection is damaged or terminal is deformed;
- (3). Check whether installation bolt, grounding wire is damaged;

2. Maintenance inspection of safety airbag system

1. Safety Airbag Module

- (1). Check whether there is dent, crack or deformation in backing strap cover;

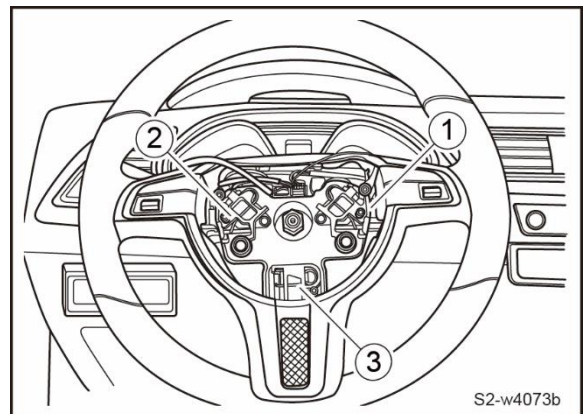
- (2). Check whether connection is damaged, terminal is deformed or wire gets stuck;
 - (3). Check whether there is dent, crack or deformation in safety airbag gas generator housing;
 - (4). Install safety airbag assembly to steering wheel, and check coordination with steering wheel or alignment state;
2. Warning/Note Label
- (1). On steering wheel skeleton;
 - (2). On safety airbag assembly of driver's side;
 - (3). On safety airbag assembly of passenger's side;
 - (4). On safety airbag control module (ACU);
 - (5). Obey instructions on label when maintain SRS. If label dirty or damaged, please replace them;
3. Airbag Control Module (ACU)
- Δ Warning When ACU failure, must replace, don't maintain it.
3. Disposal treatment method of safety airbag system component
- Before abandoning safety airbag or vehicle with safety airbag, it needs to denote airbag, personal can't denote airbag privately, please give to professional person to denote.

III、Safety Airbag Assembly of Driver's side (DAB)

(I) Removal

1. Open engine hood cover
2. Disconnect negative electrode of battery Refer to "Disconnection and connection of battery electrode"
3. Remove safety airbag assembly of driver's side (DAB)

- 1). Use screwdriver to insert into removal hole ① in 3H, screwdriver push clamp spring on skeleton forward along guide groove on skeleton, and separate DAB clamp detent from steering wheel skeleton.
- 2). Use screwdriver to insert into removal hole ② in 9H, screwdriver push clamp spring on skeleton forward along guide groove on skeleton, and separate DAB clamp detent from steering wheel skeleton.
- 3). Rotate steering wheel 90° anticlockwise, and use screwdriver to insert into removal hole ③ in 6H, screwdriver push clamp spring on skeleton forward along guide groove on skeleton, and separate DAB clamp detent from steering wheel skeleton.
- 4). After three clamp detents separating from steering wheel skeleton, pull DAB out from steering wheel along axial direction of steering column.



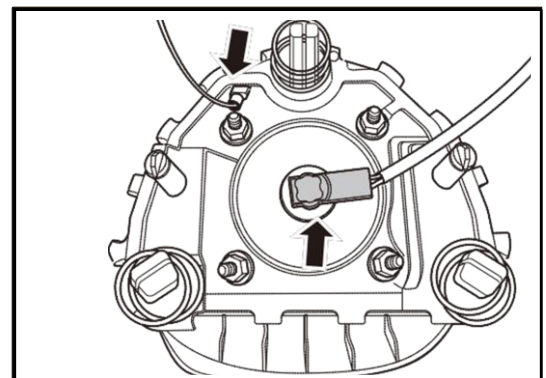
ΔNote Screwdriver push clamp spring forward along guide groove, clamp spring get deformed, and DAB clamp detent separate from clamp spring.

ΔNote When removing steering wheel with bright trim, please make sure time of pulling out DAB in 6H position to be not less than in 3H and 9H position. Or else 6H position of DAB may drag steering wheel bright trim, and lead to bright trim damaged or crack.

Δ Note Disconnecting battery negative electrode for at least 1 minute before removing DAB.

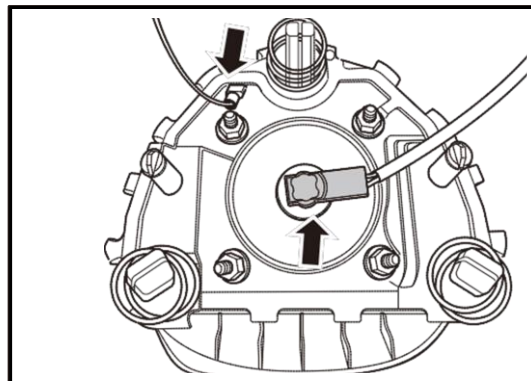
- 5). Disconnect wiring harness connector of driver's side airbag and wiring harness connector of horn, and take down driver's side airbag assembly;

Δ Note Please place airbag assembly to right place.



(II) Installation

1. Install driver's side airbag assembly
 - 1). Connect wiring harness connector of driver's side airbag and wiring harness connector of horn;
 - 2). Install driver's side airbag to steering wheel, and ensure 3 clamp detent to be in right place;



2. Connect negative electrode of battery
3. Close engine hood cover

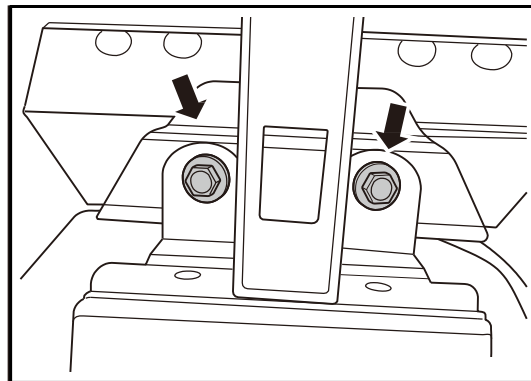
IV、Front Passenger's Side Airbag Assembly

(I) Removal

1. Open engine hood cover
2. Disconnect negative electrode of battery
3. Remove glove box assembly Refer to "Glove box assembly"
4. Remove front passenger's side airbag assembly

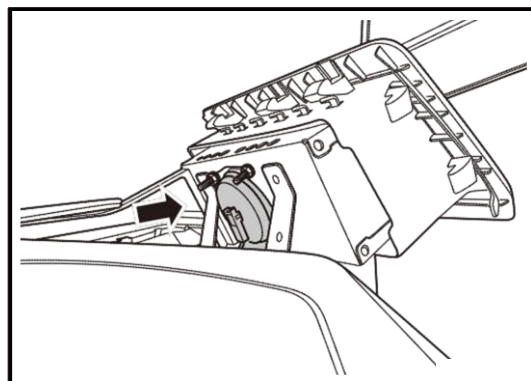
- 1). Remove 2 fixed bolts of front passenger's side airbag assembly and dashboard beam;

△ Note Disconnect battery negative electrode at least 1minute before removing front passenger's side airbag assembly.



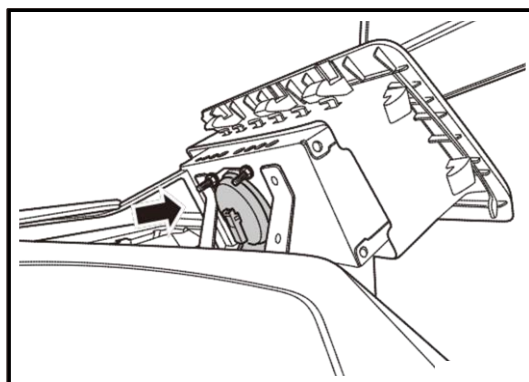
- 2). Pry cover plate of front passenger's side airbag;
- 3). Disconnect wiring harness connector of front passenger's side airbag assembly, and take front passenger's side airbag assembly out from airbag frame of dashboard;

△ Note Place cover plate upward to front passenger's side airbag assembly.

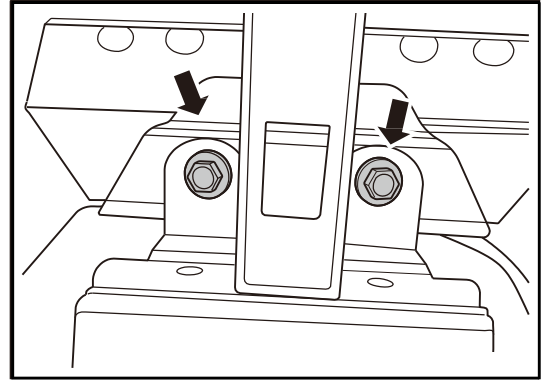


(II) Installation

1. Install front passenger's side airbag assembly
 - 1). Connect wiring harness connector of front passenger's side airbag assembly, and install front passenger's side airbag to dashboard;



2). Install 2 fixed bolts of front passenger's side airbag assembly and dashboard beam;



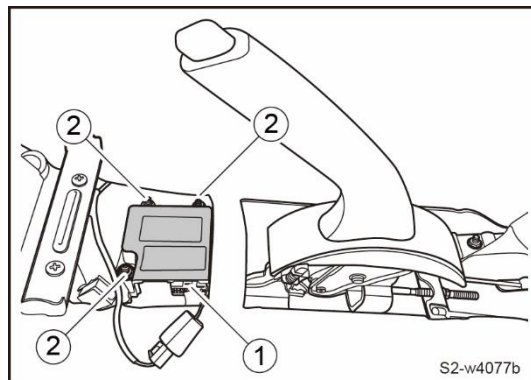
2. Install glove box
3. Connect battery negative electrode
4. Close engine hood cover

V、Airbag Controller

(I) Removal

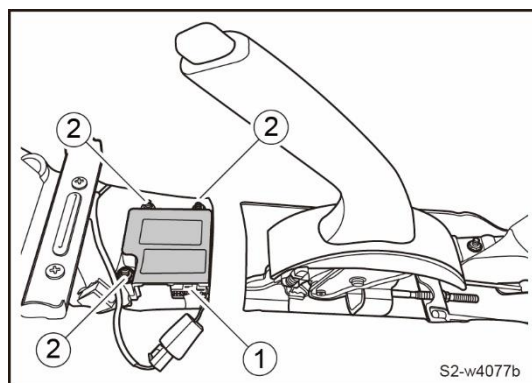
1. Open engine hood cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove front extension plate assembly Refer to “Front extension plate assembly”
4. Remove saucer cover plate assembly Refer to “Auxiliary dashboard assembly”
5. Remove front storage box assembly Refer to “Auxiliary dashboard assembly”
6. Remove auxiliary dashboard assembly Refer to “Auxiliary dashboard assembly”
7. Remove airbag controller

- 1). Disconnect wiring harness connector ① of airbag controller;
- 2). Remove 3 fixed nuts ② of airbag controller;
- 3). Take out airbag controller;



(II) Installation

1. Install airbag controller
 - 1). Place airbag controller to installation position, and tighten 3 fixed nuts ② of airbag controller;
 - 2). Connect wiring harness connector ① of airbag controller;



2. Install dashboard assembly
3. Install front storage box assembly
4. Install saucer cover plate assembly
5. Install front extension plate
6. Connect negative electrode of battery
7. Close engine hood cover

BCM Device

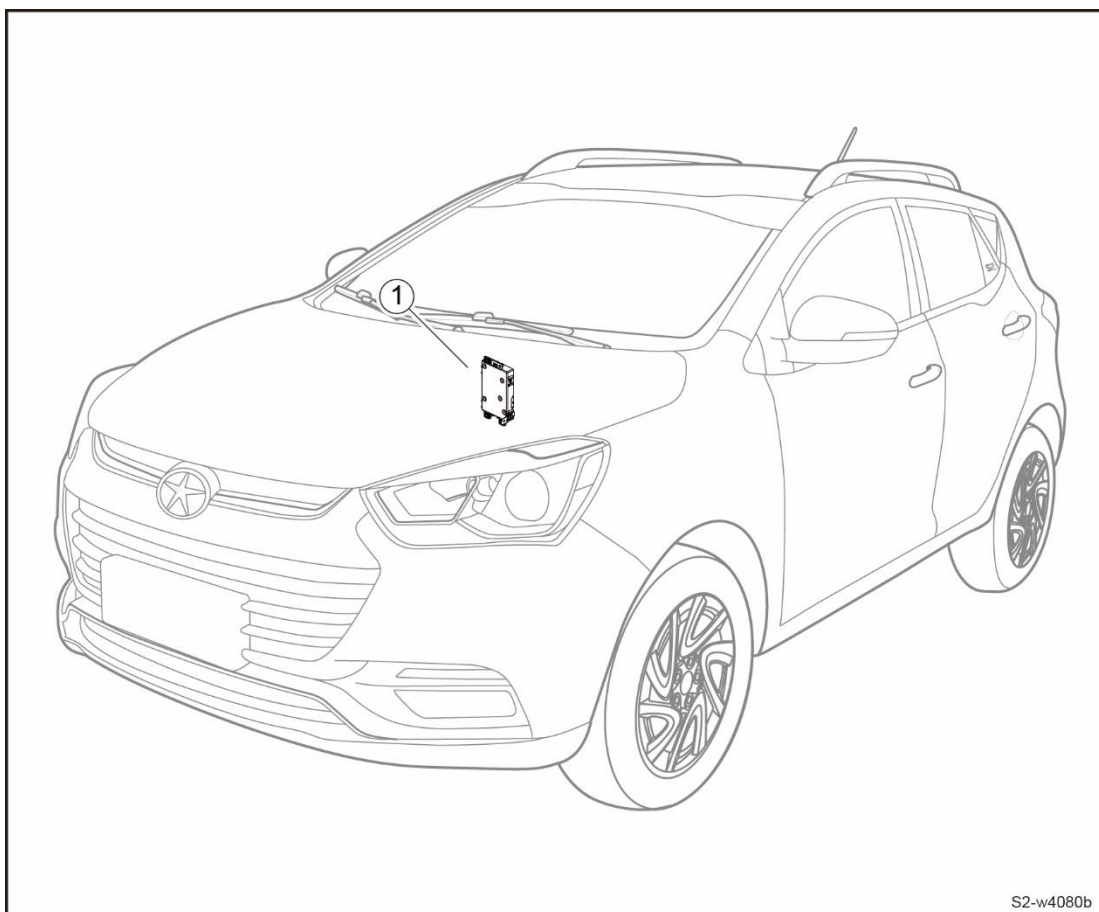
I、Summary

(I) Structure Outline

To reduce failure rate of vehicle and carry out more effective hommization control, use body control device to centrally control all kinds of electrical units. Vehicle body control device includes one radio frequency receiver. Main functions of vehicle body control device:

- Front/Rear wiper control
- Key hole illumination control
- Indoor light control
- Day driving light control
- Position light control
- Front/Rear fog light control
- High beam light control
- Low beam light control
- Automatic light control
- Brake light control
- Turning light and hazard warning light
- Economize on electricity
- Remote control or mechanical key lock
- Remote control or mechanical key unlock
- Automatically lock function
- Reset function
- Remote control tail door unlock
- Central control lock/unlock function
- Pulling out key unlock function
- Collision force unlock function
- Anti-mistake-lock function
- Rear defrost control
- Electrical power window control
- Anti-clamping motor control
- Manual brake signal retransmission
- Reversing signal retransmission
- Engine hood cover signal retransmission
- Vehicle body anti-theft system

Component Position



1. BCM controller assembly

(II) Function Requirement

Wiper System

1. Front Wiper Control

BCM controls wiper motor and water spraying pump by monitoring state of wiper switch and combination switch, and realizes all working mode of wiper system: front wiper low speed working, front wiper high speed working, front wiper intermittence working, front wiper closed, front windshield spraying water etc..

1) When ignition switch to "ON", front wiper controlling switch connects to high speed/low speed/intermittence position, namely corresponding switch on, thus front wiper performs corresponding action.

2) When wiper switch is in intermittence position, Intermittence regulating time has 5 gears. Intermittence regulating time shown as below:

When vehicle speed is higher than 60km/h (can equipped with 60km/h or 100km/h, default 60km/h), if use intermittence mode, reduce 4s on the set time.

Vehicle speed treatment: received signal on network is 15 bits, valid value range is 0x0-0x14D5, ratio coefficient is 0.05625.

3) Wiper high/low speed control: when switch connects to low speed position, low speed relay actuated, motor works in low speed. If switch connects to high speed, high speed relay actuated, motor works in high speed.

4) When inching switch works, low speed always works.

5) Front spraying water is less than 400ms, wiper not works; when more than 400ms, wiper always work with spraying water, and then wiping three times after water spraying stopping.

6) Front wiper resetting control: After switch is off, when motor is not running to initial position, BCM not receives resetting position signal, high speed relay cut off, low speed relay not cut off, and motor continues to work; when motor runs to initial position, resetting switch is actuated, BCM receives resetting position signal, low speed relay cuts off, and motor stops running.

7) When in intermittence position, water spraying is prior.

8) Wiper high speed running period is 1s, and low speed running period is 4/3s.

Emergency strategy When running, if detecting front wiper resetting switch not change for 18s, it can judge that motor gets stuck, and close output. At the same time only when ignition switch one circulation of ON-OFF-ON or wiper switch connect to other switch position from OFF, it can restart wiper.

2. Rear Wiper Control

BCM controls wiper motor and water spraying pump by monitoring state of wiper switch and combination switch, and realizes all working mode of wiper system: rear wiper and rear wiper spraying water etc..

Rear wiper can be configured to be there is or not by diagnosis, default is open rear wiper.

1) There are only “ON” and “OFF” in rear wiper, and it always wipes in low speed when in “ON”;

2) Rear wiper doesn't work after rear water spraying switch is on for less than 600ms, rear wiper works a wiper period at least after the switch is on for 600ms;

3) When spraying water time is more 3s than a wiper period, it wipes a period.

Light Control

1. Keyhole Illumination Light Control

Keyhole illumination is mainly to be convenient to insert key for customer. When key not inserting ignition switch, driver's side door is open, keyhole illumination light is on; when turning ignition switch to “ON”, keyhole illumination light will be off, and after door is closed, keyhole illumination light is on for 10s and then off.

2. Position Light Control

Indoor top light is to illuminate when driver and passengers getting into vehicle or inside the vehicle.

1) When door light is in automatic position and satisfies one of the following conditions, interior light will be immediately on:

- 1、Undefended success;
- 2、Any door is open;

2) When satisfying one of the following conditions, interior light will be off gradually:

- 1、After undefended successfully, interior light will be on for 30s and then off gradually;
- 2、When open vehicle door from closed state, interior will be on for 30s, and then off gradually;

3) When satisfying the following conditions, interior light will be off immediately:

- 1、When open vehicle door from closed state, interior is on continuously, if door is open for more than 15min, interior will be off immediately;
- 2、When defended successfully, interior top light will be off immediately, immediately off after defended successfully is prior to interior light working 30s and then off gradually after undefended successfully;
- 3、When four doors are closed, ignition switch is in “ON”, interior light will be off immediately;

4) Collision signal detonates interior light on:

- 1、When collision signal is effective, interior will be on immediately;
- 2、After collision signal detonating interior light on, if ignition switch is turned from “OFF” to “ON”, interior light will be off immediately. Interior light gradually off time is $5.5 \pm 0.5s$.

3. Day Driving Light Control

Day driving light is to warning when driving in daylight. Day driving light can be configured to be there is or not by diagnosis, default is open day driving light. Used to enable control of day driving light:

- 1) When turning ignition switch to “ON”, put down manual brake, position light has no output, then day driving light will be on;

- 2) When ignition switch is not in “ON”/ “ST” or manual brake is not pulled up or position light has output, day driving light will be off;

4. Position Light Control

Position light is to shown width and indicating. Position light has high and low configuration.

Low Configuration:

When ignition switch is in any position, position light switch input is effective or automatic light requesting position light on, position light, license plate light and backlight output is on; when position light switch input is ineffective and automatic light requesting position light off, position light, license light and backlight output is off.

When position light switch input is still effective, if left front door is open, pull out key, small light will be off immediately; if left front door is closed, pull out key, small light will not be off; left front door open, small light will be off, and it will be on when key inserted.

High configuration (with PEPS) :

When ignition switch is not in OFF, position light switch input is effective or automatic light requesting position light on, position light, license plate light and backlight output is on; when position light switch input is ineffective and automatic light requesting position light off or ignition switch is in OFF, position light, license plate light and backlight output is closed.

5. Rear Fog Light Control

Rear fog light is mainly to warning in foggy weather. Rear fog light will be on when satisfying the following conditions:

Open Condition:

Ignition switch is in “ON”, at least one of front fog light, low beam light or high beam light is on, and rear fog light (transient state) is effective.

Closed condition:

- 1) When position light is off or rear fog light switch is off, rear fog light is off;
- 2) Ignition switch is turned to other position except “ON”;

4. Emergency Strategy

States of rear fog light are the same before and after starting.

6. Front Fog Light Control

Front fog light is mainly to warning in foggy weather. Front fog light can be configured to be there is or not by diagnosis, default is open front fog light.

- 1) When ignition switch is in “ON” and position light is on, press front fog light switch to open front fog light. Front fog light switch is normal state switch;
- 2) When position light is off or front fog light switch is closed or ignition switch is turned to other position except “ON”, front fog light will be off.

7. High Beam Light Control

High beam light is mainly to illuminate distance in night.

To BCM, overtaking light and high beam light uses one input, in which overtaking light can mechanism automatically return. High beam light function description are shown as below:

- 1) When ignition switch is in “ON”, and low beam light switch is on or [automatic light switch is on and BCM judging it is night through value of sunshine sensor] (even low beam light is not on), BCM output high beam light enable low effective signal, the signal connect back to high beam light switch through wiring harness;
- 2) When ignition switch is in “ON”, and high beam light enable signal is effective, open high beam light switch, high beam light is on;
- 3) When high beam light switch is closed, or ignition switch is not in “ON”, or high beam light enable signal is ineffective, high beam light is off;
- 4) Anytime, when high beam light is on, low beam light is on at the same time. Whether high/low beam light is on at the same time can be decided by configuration, default is high/low beam light on at the same time.

8. Low Beam Light Control

Low beam light is mainly to illuminate vicinity in night. Front headlight mechanism structure is: when turning to low beam light, position light switch is on.

Low beam light function is described as below:

- 1) When ignition switch is in “ON”, and BCM detecting low beam light switch input is effective, low beam light is on.
- 2) When ignition switch is in “ON”, and BCM detecting low beam light switch input is effective and automatic light requesting headlight on, low beam light is on.
- 3) When ignition switch is in “OFF”, overtaking light switch turned from “ON” to “OFF” denotes the function of “taking me home”, one ignition circulation denotes one “taking me home” function, enable the function of “taking me home” again when ignition state turned to “OFF” next time, low beam light is continuously on for 30s.
- 4) When ignition switch is in “ON”, and low beam light switch is on or [automatic light switch is on and BCM judges it is night by value of sunshine sensor] (even low beam light is not on), BCM output high beam light to enable effective signal, the signal connects to high beam light switch by wiring harness.

When in the condition 1 above, low beam light is closed when detecting corresponding low beam light switch is closed.

When in the condition 2 above, low beam light is closed when automatic light switch is closed or request signal is valid.

When in the condition 3 above, low beam light is closed when time is up or ignition switch is turned to “OFF”.

Note: Automatic light request signal is valid indicates light “AUTO” is valid, sunshine signal gets up to light threshold value requirement. For automatic light strategy please refer to “automatic light”.

9. Automatic Light Control

Function of automatic light is to lit position light and low beam light when light outside is dark and light control switch is in automatic position. Automatic light function gets to know outside condition by sunshine sensor.

Two EEPROM can be equipped with threshold

AutolampDay_Cfg: range is 0-5V, initial value is 1.8V (specific corresponding initial threshold is supplied by sensor),
AutolampNight_Cfg: range is 0-5V, initial value is 1.2V (specific corresponding initial threshold is supplied by sensor).

1. When BCM power on to initialization, default the night;
2. When input voltage of automatic light sensor is higher than AutolampDay_Cfg, judge it is daytime;
3. When input voltage of automatic light sensor is lower than AutolampDay_Cfg, judge it is nighttime;

10. Brake Light Control

Brake light is mainly to lit the light when braking. When ignition state is in any position, braking switch is valid or braking request on network is valid, thus open brake light and high position brake light, brake light and high position brake light are controlled partly.

When in normal mode, brake light and high position brake light can both open through MCU control or brake switch control.

When in limphome mode, brake light and high position brake light should can be controlled by brake switch.

11. Turning light and Hazard Warning Light

Turning light mainly consists of left front turning light, left side turning light, left rear turning light, left turning indicating light, right front turning light, right side turning light, right rear turning light, right turning indicating light. When working, turning light twinkles with the frequency of 90 ± 10 times per minute. Time of on and off are the same. Left front turning light, left side turning light and left rear turning light merge one way output, right front turning light, right side turning light and right rear turning light merge one way output, and left turning indicating light and right turning indicating light transmit to meter by CAN.

- 1) When ignition switch is in “ON”, turning switch is connected or disconnected, thus corresponding turning light twinkle or closed, and at the same time denotes or connect to tell-tail light on dashboard and flashlight relay twinkle and tweet in the same frequency;
- 2) When turning light switch is turned to left or right, BCM drive corresponding turning light to activate to twinkle 3 times at least;
- 3) When turning light is closed after activating, turning light will be closed after completing its incipient minimum three times twinkle periods.
- 4) When turn turning light switch from left to right after left turning light is activated, left side turning light will be off, and right side turning light will be on.
- 5) When turn turning light switch from right to left after right turning light is activated, right side turning light will be off, and left side turning light will be on.
- 6) Hazard warning light includes two side turning light, key in any position all can drive these turning lights to warning, corresponding switch is self-lock switch.

7) When ignition switch is in "ON", warning light is prior to turning light, specified instruction are shown as below: if turning light is on, open warning light switch, then warning light is on instead of turning light, and system gets back to turning light on state until warning light switch is off; if warning light is on, turn turning light switch to left or right, then turning light is on instead of warning light, and system gets back to warning light on state until turning light output is closed or ignition switch is turned from "ON" to "OFF".

8) If receive collision signal, all lights work at least 5s in warning light state, and pressing warning light switch again after 5s will close warning light, which is to prevent warning light switch being pressed due to collision; when detecting ignition switch is turned from "ON"- "OFF"- "ON", collision is removed, warning light recover to normal work.

9) When turning light reports fault due to short circuit to grounding or overload, short circuit state will be recorded to memory through relevant DTC, and disconnect the side turning light high side drive core immediately, turning indicating light on combination meter will be off; if turning light is on again and don't carry out corresponding operation during this time ignition circulation, must restart ignition switch once (ignition switch ON-OFF-ON), thus output can recover to normal.

10) When working in turning light working mode, some side turning light reports fault due to open circuit or short circuit to power supply, open circuit state will be recorded in memory through relevant DTC, and the side turning light will twinkle with double frequency, turning indicating light on combination meter will twinkle with double frequency. Must restart ignition switch once (ignition switch ON-OFF-ON), thus output can recover to normal; or open circuit fault is removed during this time ignition circulation, which can recover to twinkle with normal frequency.

Note: Parts marked red indicate that it can close warning light signal after collision signal happened 5s.

12. Power Saving Control

It is mainly to save battery power.

1) If detecting any signal change when BCM is in "OFF", connect power saving relay immediately, and recover supplying power:

- Any door state signal of four doors
- Remote control unlock signal
- Central control unlock signal
- Ignition state signal
- Mechanism key unlock signal

2) After connecting power saving relay, all signals above don't change, thus close power saving relay after 15 min.

3) After connecting power saving relay, detecting any signal above changing again, thus start 15 min timing again.

4) When ignition switch is in "ON", "ACC", "START", power saving relay is always actuated.

5) After BCM getting into dormancy, close power saving relay.

Lock System

Lock system control door lock by interior relay of BCM.

Vehicle lock function description :

Defended state: all vehicle doors close, use remote control to lock or BCM state after driver's side key lock successfully;

Undefended state: use remote control to unlock or driver's side key unlock or state after tail door remote control unlock;

Remote control launcher function: Don't respond to remote control order in condition of key inserting signal is valid.

Door Lock Function

Door lock is controlled by BCM interior relay, BCM control door lock motor after receiving valid unlock signal, output time of four doors lock motor unlock and lock is 250ms, output time of tail door lock motor unlock. There is lock motor inside vehicle door lock, and there are 2 mechanism states:

Unlock state: vehicle door lock can open from exterior or interior.

Lock state: vehicle door lock only can open from interior.

1. Remote Control or Mechanism Key Lock

When defended, whether horn tweets is achieving by configuration, default not tweet.

When in undefended state, after BCM receiving valid remote control lock signal or driver's side mechanism key lock signal, if five doors and engine hood cover are all closed, four door are lock, two side turning lights twinkle once, twinkle period is 1s, in which 0.5s on, 0.5s off, horn tweets 10ms. If BCM receiving remote control unlock order in twinkling period, light twinkling turns into unlock twinkling procedure; if any other door is not closed after driver's side door closed, lock motor works, turning light not twinkles. After all doors are closed, perform confirmed action again (if there is key inserting, left front door open or central control unlock/lock, cancel performing confirmed action again), namely two side turning light twinkle once, twinkle period is 1s, in which 0.5s on, 0.5s off, and horn tweets 10ms.

When in defended state, after BCM receiving valid remote control lock signal, BCM still carry out lock action, and perform confirmed action, namely lock motor works, two side turning lights twinkle once, twinkle period is 1s, in which 0.5s on, 0.5s off, and horn tweets 10ms.

2. Remote Control or Mechanism Key Unlock

When defended, after BCM receiving valid remote control unlock signal or driver's side mechanism key unlock signal, four doors unlock, BCM is undefended and perform confirmed action, namely two side turning lights twinkle twice and then off. Each twinkle period is 1s, in which 0.5s on, 0.5s off, and horn tweets 10ms.

When undefended, after BCM receiving valid remote control unlock signal or driver's side mechanism key unlock signal, BCM is undefended and perform confirmed action, namely two side turning lights twinkle twice and then off.

In undefended state, after BCM receiving valid remote control unlock signal or driver's side mechanism key unlock signal, BCM unlock, two side turning light correspondingly twinkle twice.

3. Automatic Lock Function

When vehicle speed up to presetting value n (there are 40km/h and 15km/h in EEPROM, default value is 15km/h, realized by configuration), if driver's side lock motor is unlock, when driver's door is closed, BCM will automatically lock vehicle door.

4. Re-defended Function

If there is not 5 doors and engine hood cover opening or key inserted ignition switch, then try to lock by remote control (Please refer to remote control lock).

5. Remote Control Tail Door Unlock

After receiving remote control tail door open signal in defended state, relieve defended state; after receiving tail door unlock signal in 30s, carry out 500ms open tail door motor; When not open rear tail door over 30s or open rear tail door and then close rear tail door, get into defended state again, and can't unlock through tail door unlock signal.

In undefended state, if driver's side door lock is locked, after receiving remote control opening tail door signal, receiving tail door unlock signal in 30s, carry out 500ms open tail door motor; When not open rear tail door over 30s or open rear tail door and then close rear tail door, get into defended state again, and can't unlock through tail door unlock signal.

In undefended state, if driver's side door lock is locked, after receiving remote control opening tail door signal, carry out 500ms opening tail door motor. Remote control opening tail door signal is prior to judgment of driver's side door lock state.

6. Central Control Unlock/Lock Function

When in defended state or warning state, central control unlock/lock is invalid.

Central control switch control lock:

After BCM receiving central control lock switch signal in undefended state, if five doors and engine hood all are closed, then lock four doors; if driver's door is not closed, lock motor doesn't work; if other doors or engine hood cover is not closed, lock motor works. If lock motor is already in lock state, after BCM receiving central control lock switch signal, lock motor locks again.

Central control switch control unlock:

After BCM receiving central control unlock switch signal in undefended state, four doors motor unlock. If four doors are in unlock state, after BCM receiving central control unlock switch signal, lock motor unlock again.

7. Pulling Key Unlock Function

After key pulled out from ignition switch, BCM drive door lock motor to unlock four doors.

8. Collision Force Unlock Function

When ignition switch is in "ON", after BCM receiving valid collision signal, BCM forces to open four door lock; shield central control unlock function and remote control unlock function.

When BCM detecting ignition switch changing from "ON" to "OFF" to "ON", recover automatic lock function, central control lock function and remote control lock function and mechanism key lock function (collision is prior).

9. Anti-mistaking Lock Function

When driver's side door open, detecting key inserted into switch and left front door lock state both exist, carry out 3 unlock order immediately, and every unlock intermittence is 0.5s.

Auxiliary System

1. Rear Defrost Control

Rear defrost is mainly to be convenient for customer to remove frost and snow on rear windshield. Rear defrost function description:

- 1) Each time BCM power on again, rear defrost output is closed.
- 2) Precondition of rear defrost output starting is that generator L terminal is valid.
- 3) Rear defrost switch signal transmitted by A/C controller is 200ms $\pm$ 5% high voltage. If prior to front and rear defrost output closed, precondition of satisfying 2) described above, receive rear defrost switch signal once, rear defrost output opens; if prior to front and rear defrost output open, receive rear defrost switch signal once, rear defrost output closes.
- 4) If always not receive rear defrost switch signal in the state of rear defrost output open, rear defrost output automatically closes after lasting open for 20min.

2. Electrical Power Window Control

- 1) It can open when ignition switch is "ON"
- 2) Left front door doesn't open but can start in 30s after ignition switch "ON"- "OFF", if left front door opens or 30s time is up, it closes, and can't operate window to up and down.

3. Anti-pinching Motor Control

Through LIN bus, obey to LIN2.0 protocol, BCM is used as main node to use first route LIN. BCM displays corresponding DTC after receiving corresponding signal, BCM displays DTC by judging WL_SWICHES_FAULT_FL.

4. Manual Brake Signal Retransmission

After collecting manual brake hardwire signal, BCM transmits manual brake signal to CAN network. Detail description is that: put down manual brake to make vehicle in driving state, at this time switch is in hanged state; pulling up manual brake is low voltage (GND). BCM retransmits the state to CAN network meter.

5. Reversing Signal Retransmission

After collecting reversing signal, BCM transmits reversing gear position signal to CAN network.

When reversing gear position switch signal is valid Vbattery(KL.30), BCM transmits corresponding reversing gear position ReverseSw=0x1 to CAN network; when reversing gear position switch signal is hanged, BCM transmits corresponding reversing gear position ReverseSw=0x0 to CAN network.

6. Engine Hood Cover Signal Retransmission

BCM collects switch state of engine hood cover, and transmits corresponding CAN signal. When engine hood cover is open, EMS should be not start.

Vehicle Body Anti-theft System

Vehicle body warning module is to realize warning function when vehicle in all kinds of abnormal states. Once warning module is activated, audible and visual warning will start and remind customer to restrain starting function at the same time.

Warning function description (hazard warning light twinkle period is 1s, in which 0.5s on, 0.5s off):

- 1) When five doors and engine hood cover are all closed, use remote controller or driver's side key to lock, hazard warning light twinkle once, horn tweet 10ms, and in defended state; if driver's side door is closed but other doors or engine hood cover is not closed, use remote controller to lock door, door is locked, and at this time in defended waiting state; when all doors and engine hood cover are all closed, hazard warning light twinkles once, horn tweens 10ms and get into defended state.
- 2) In defended state, five doors or engine hood cover open, or detect key inserting signal, vehicle will warning, and start restrain relay output enable restrain starting; alarm whistle warning period: tweet T1(27 $\pm$ 2sec), interval T2(10 $\pm$ 1sec); tweet and hazard warning light twinkle, warning for 3 periods (activate warning condition in 3 periods, not repeat calculate time). In the condition of after warning 3 periods finishing and satisfied with defended, BCM gets into defended state, close tweet, and starting restrain is closed; in the condition of after warning 3 periods finishing but not satisfied with defended, BCM gets into defended waiting state, starting restrain still open, and activate warning condition not warning again.

- 3) Use remote control to unlock or driver's side key unlock/lock to relieve warning state, four doors open, hazard warning light twinkle twice.
- 4) Use remote control tail door unlock signal to relieve warning state, and hazard warning light twinkle twice.
- 5) In warning state, if five doors and engine hood cover are open, press lock button of remote controller, then exit warning state, all doors are locked, right and left side turning light twinkle once, horn tweet 10ms, anti-theft relay closed, and get into defended state again.

In warning state, if five doors and engine hood cover are open, press lock button of remote controller, then exit warning state, all doors are locked, anti-theft relay closed, horn stop warning, and after all door closed, right and left side turning light twinkle once, and get into defended state; In warning state, if driver's side door is open, press lock button of remote controller, then exit warning state, don't carry on lock order, anti-theft relay is closed, and horn stop warning.
- 6) In warning state, use remote controller or mechanism key to unlock and relieve warning, unlock relay output unlock signal, door is in unlock state; relieve warning state, hazard warning light twinkle twice, alarm whistle stop alarming.
- 7) When cutting off power supply and power on again, should be back to state before power off.
- 8) In the state of defended,, after carrying on undefended by remote control to unlock or driver's side key to unlock, any door or engine hood cover is not open in 30s or key insert into ignition lock and gets into defended state again.
- 9) When door and engine hood cover are closed and ignition switch inserting, carry on mechanism key to unlock, BCM carries on unlock/lock output, but not carry on release defended function.

(III) Technical Parameter

1. Dormancy and Arouse Strategy

Three conditions satisfying at the same time can get into dormancy state :

1. Function satisfies dormancy condition;
2. CAN network satisfies dormancy condition;
3. LIN network satisfies dormancy condition.

In which function satisfies dormancy condition is :

1) Pull out key (this condition only for BCM without PEPS), there is no output in interior/exterior light and front/rear wiper, there is no output request in door lock, anti-theft warning is not triggered, rear defrost is not open, and electrical power window is not enabled. Last 60s and not change.

2) BCM is not in diagnosis mode

Before BCM getting into dormancy state, close all output signals. After getting into dormancy, all input signals can arouse BCM from dormancy.

1) Switch signal: key inserting signal, IG2, IG1, ACC, hazard warning light switch, position light switch, mechanism key lock/unlock switch signal, four doors+ engine hood cover+ rear trunk door state switch, rear trunk unlock switch, driver door lock state, brake light switch, central control lock

2) CAN network (Including PEPS signal) : CAN interrupt arouse

3) RKE : There is remote control order

4) Diagnosis : Get into diagnosis mode

LIN arouse : After BCM arousing, LIN arouses.

2. Bus and Diagnosis

BCM supplies diagnosis of CAN-line to be convenient to maintenance of BCM. Diagnosis parts need the following functions:

- Parameter configuration (EEPROM read/write)
- Read DTC and clear DTC
- IO Control
- BCM controller information
- Off assembly line matching function
- ECU reset

Support one CAN bus to be as terminal node on network, and don't use network terminal (namely there is no terminal resistance) in this project, one LIN bus to be as network main node.

3. Voltage Abnormal Treatment Strategy

Normal working voltage of BCM is 9V-16V, and is carried on according to voltage management strategy established by platform, and there are five states:

Normal voltage: 9-16V;

High voltage: higher than 16V momentarily, more than 40ms, but back to normal voltage in 440ms;

Low voltage: lower than 9V momentarily, more than 40ms, but back to normal voltage in 80ms;

Overvoltage: higher than 16V for long, more than 440ms, but don't back to normal voltage;

Undervoltage: lower than 9V for long, more than 80ms, but don't back to normal voltage;

1. Permit to output in the state of normal voltage/high voltage/low voltage
2. Close output in the state of overvoltage/undervoltage, recover output after system voltage back to normal.

Working voltage range of CAN network: 7-17.5V; working voltage range of LIN network: 7-16V; working voltage of DTC: 8-16V.

4. Short Circuit and Open Circuit Protection Strategy

To high side output, detect short circuit and open circuit when On-stage. Once detecting short circuit or open circuit, counter starts to counting, and when gets up to a certain value, it can be judged as open circuit or short circuit, and display corresponding DTC. When detecting short circuit to power supply, once detecting short circuit to power supply, counter starts to counting, and when gets up to a certain value, it can be judged as short circuit to power supply, and display corresponding DTC.

To SPI low side output, we only need to read diagnosis information of its storage to judge.

When in Off-stage, if diagnosis bit is low, it indicates output is open circuit, and counter starts to counting at the same time, and when gets up to a certain value, it can be judged as open circuit, and display corresponding DTC. When in On-stage, if diagnosis bit is high, it indicates output is short circuit to power supply, and counter starts to counting at the same time, and when gets up to a certain value, it can be judged as short circuit to power supply, and display corresponding DTC.

5. Remote Control and Learning Code

To high configuration vehicle with PEPS, BCM doesn't supply remote control function; to low configuration vehicle without PEPS, BCM supplies remote control function.

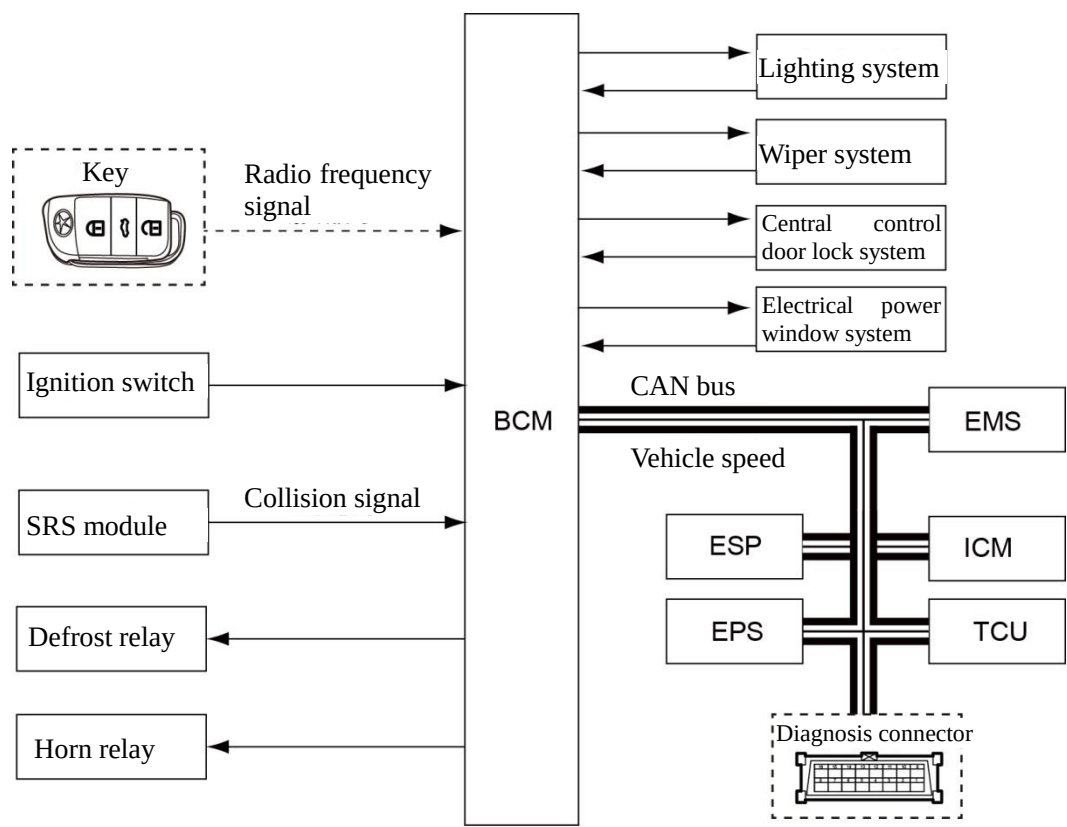
BCM module includes remote control module, used radio frequency is 433.92MHz±100kHz. There are 3 buttons on remote control key, including four doors unlock function, four doors lock function, and tail door unlock function.

When waiting for first key learning, right turning light is always on; when waiting for second key learning, right and left turning light are always on; when learning success, right and left turning light are off. Through diagnosis order or when fixed time is up, then exit learning state, remote control matching finish.

1. Once Routine can learn two keys.
2. If Routine time is more than 2 minutes, BCM exit this time Routine, and learned successful key will be wrote to EEPROM.
3. As long as key learn successfully, older keys will lose efficiency totally.
4. Press any key to learn code.
5. There are 2 exiting conditions: one is 2 minutes time, the other is diagnosis finishing order.

Ensure remote distance to be 20m. First develop without exterior antenna, and add exterior antenna if vehicle test not satisfy with customer's requirement.

Electrical Principle Schematic



(IV) Technical Parameter

No.	Parameter	Value
1	Rated voltage	DC 12V
2	Using voltage range	DC 9V~16V
3	Static state current	≤ 6mA
4	Working temperature	-40 ℃ ~+80 ℃
5	Storage temperature	-40 ℃ ~+85 ℃

(V) Torque Parameter

No.	Item	Torque (N m)
1	Vehicle body controller fixed bolt	5~8
2	Vehicle body controller fixed nut	5~8

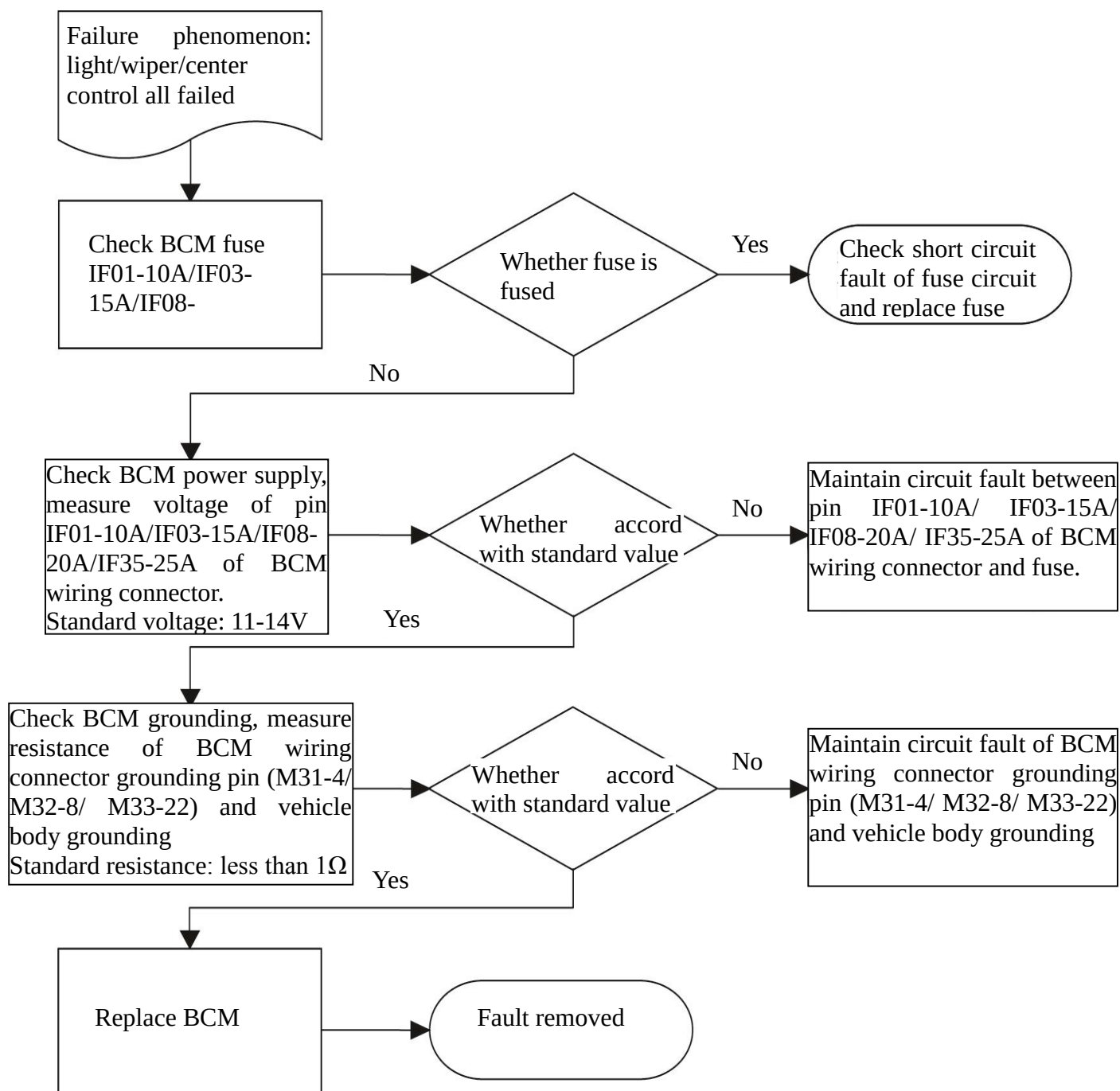
II、Troubleshooting

(I) Troubleshooting List

No.	Fault phenomenon	Fault reason analysis	Solution	Remark
1	Light, wiper, central control, wiper system all lose effective	Power supply or grounding circuit fault	Check relevant circuit	Refer to wiper central control wiper system all lose effective
		Battery power supply fault	Check charging system	
		BCM controller fault	Replace BCM controller	

(II) Troubleshooting Flow Chart

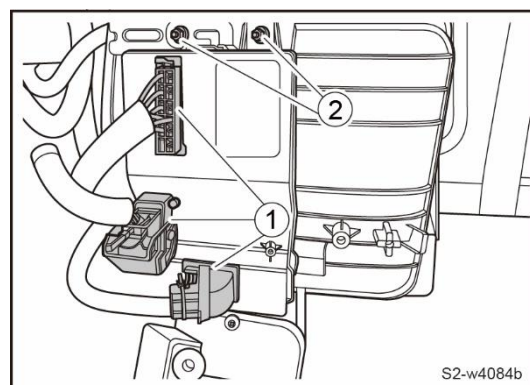
Light, wiper, central control, wiper system all lose effective



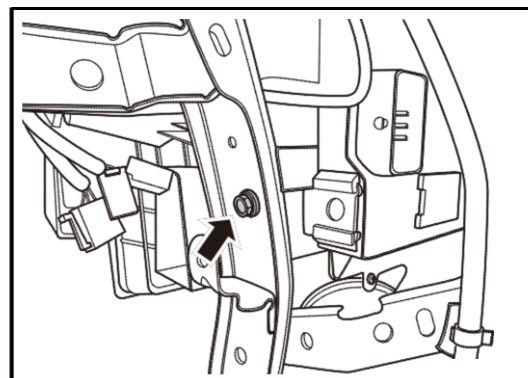
III、BCM Controller Assembly

(I) Removal

1. Open engine hood cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove A/C controller assembly Refer to “A/C controller assembly”
4. Remove vehicle body controller assembly
 - 1). Disconnect wiring harness connector ① of BCM controller assembly;
 - 2). Remove 2 fixed nuts ② of BCM controller assembly;

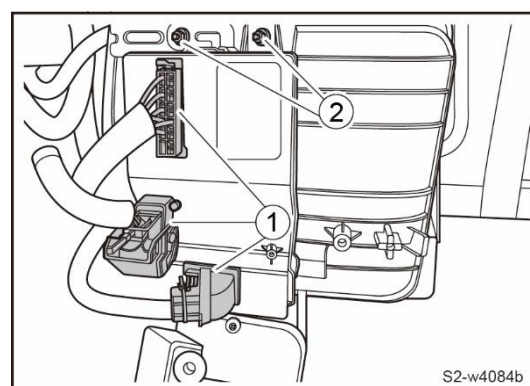


- 3). Remove left side fixed bolt of BCM controller assembly;
- 4). Take down BCM controller assembly;



(II) Installation

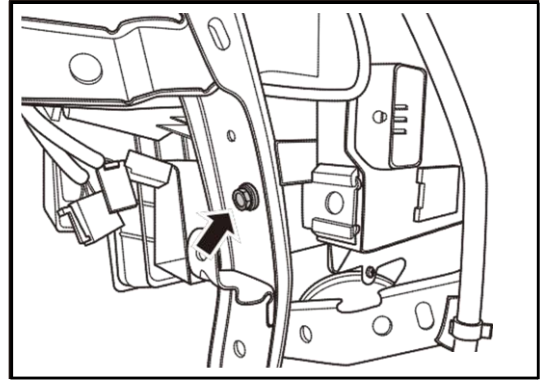
1. Install BCM controller assembly
 - 1). Place BCM controller assembly to installation position, and tighten 2 fixed nuts ② of BCM controller assembly;
Tighten torque 5~8N m
 - 2). Tighten wiring harness connector ① of BCM controller assembly;



3). Tighten fixed bolt of BCM controller assembly;

Tighten torque 5~8N m

2. Install A/C controller assembly
3. Connect battery negative electrode
4. Close engine hood cover



Combination Switch, Alternation Switch

I、Summary

(I) Structure Outline

1. Light Control Switch

Control left/right turning light, front headlight, front fog light, side turning light, overtaking light signal. In the mode of front headlight working, there are two functions, namely high beam changing to low beam, low beam changing to high beam.

1) Turning light

There are two upward (right turning) and two downward (left turning) position on turning signal operating lever. These positions are used to transmit turning signal.

Push operating lever upward or downward to send turning signal. When turning is over, operating lever will automatically return. Arrowhead on combination meter will twinkle, displaying turning direction.

If need to send turning signal or changing road signal, pull operating lever upward or downward to the end. When turning finish, operating lever will return automatically. When driver send turning or changing road signal, if turning arrowhead twinkling too fast, it indicates signal light may be damaged, other driver will not see sent turning signal. If some lamp bulb is burnt, please replace to avoid traffic. When driver send turning or changing road signal, turning arrowhead on combination meter not twinkle, please check whether lamp bulb is damaged, and then check fuse.

2) Front headlight/Low beam light converter

If switch headlight from low beam to high beam, pull turning signal/multifunctional operating lever away from driver. When high beam is on, if ignition switch is on, combination meter will display high beam light signal.

If switch headlight from high beam to low beam, pull turning signal/multifunctional operating lever to driver.

3) Overtaking twinkle

The function can send overtaking signal to drivers in front by high beam headlight. When use the function, pull signal/multifunctional operating lever to driver until headlight high beam is on, and then loosen operating lever, headlight off.

4) Front fog light

After turning front fog light switch to "ON", front fog light is on, and display front fog light signal on combination meter. Only when front fog light switch is "ON" can operate rear fog light switch on combination meter to make rear fog light on.

2. Wiper Control Switch

1) Operate mode of controlling wiper (Wiping, intermittent, low speed, high speed).

When wiper is in intermittent position, there are five kinds of intermittent time regulating.

When turn ignition switch to ON, can operate front windshield wiper. Use right side operating bar of steering column to operate front windshield wiper.

HI (High) : Turn operating bar to this position, can carry on high speed wiping.

LO (Low) : Turn operating bar to this position, can carry on stably low speed wiping.

INT (Intermittent): Turn operating bar to this position, can select delayed wiping one circulation.

Turning middle of wiper operating bar to LO can increase delayed time, and turning to HI can decrease delayed time. Only when operating bar in INT can regulate wiping speed.

2) Front windshield washing liquid

In the condition of turning ignition switch to ON and pull front windshield wiper washing liquid operating bar to driver, to wipe front windshield, and windshield wiper washing liquid will spray out from front windshield spraying nozzle.

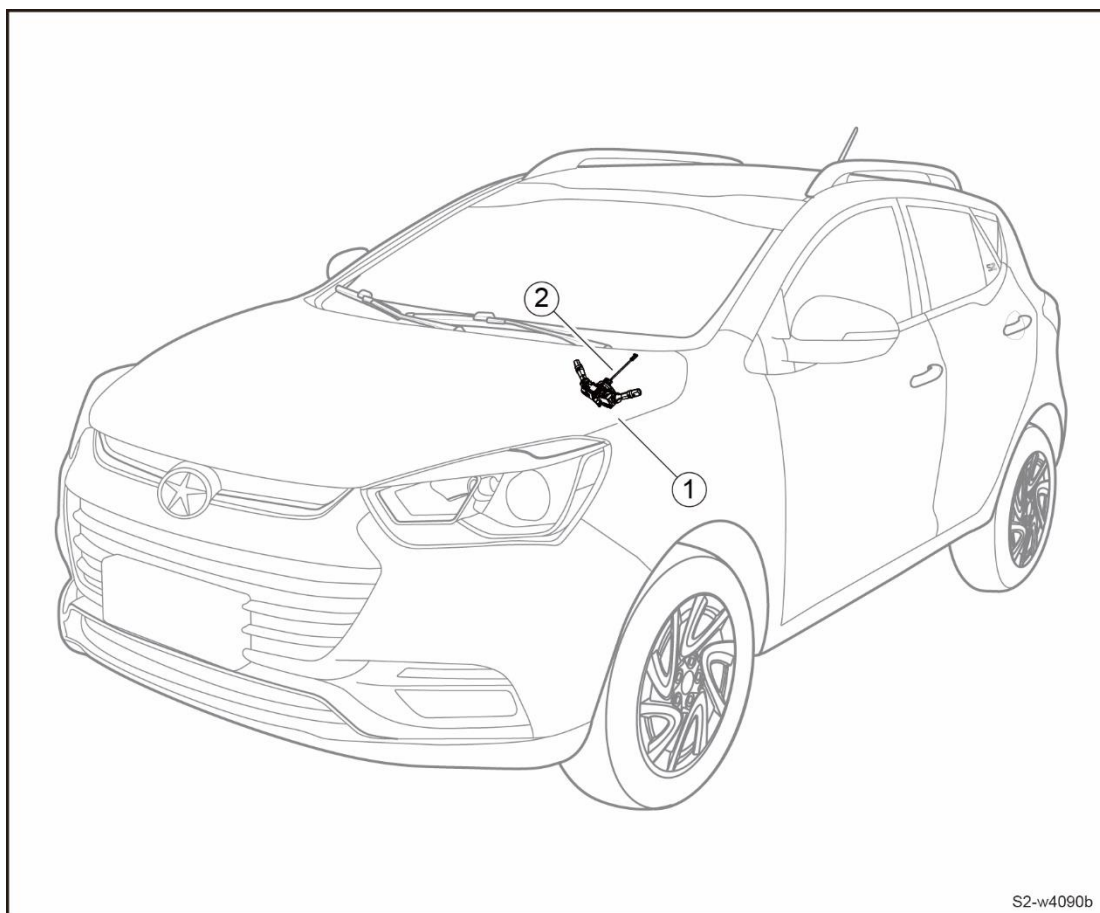
3) Rear wiper switch

Turn switch to ON can open rear wiper function.

△ Note In cooling weather, if front windshield not pre-heated, don't use wiper, or washing liquid will be frozen on front windshield, and shelter driver's vision.

△ Note When loosen operating bar, washer will stop work, but wiper will continue to wiping about 3 circulations, and then stop or recovery to the used wiping speed.

Component Position

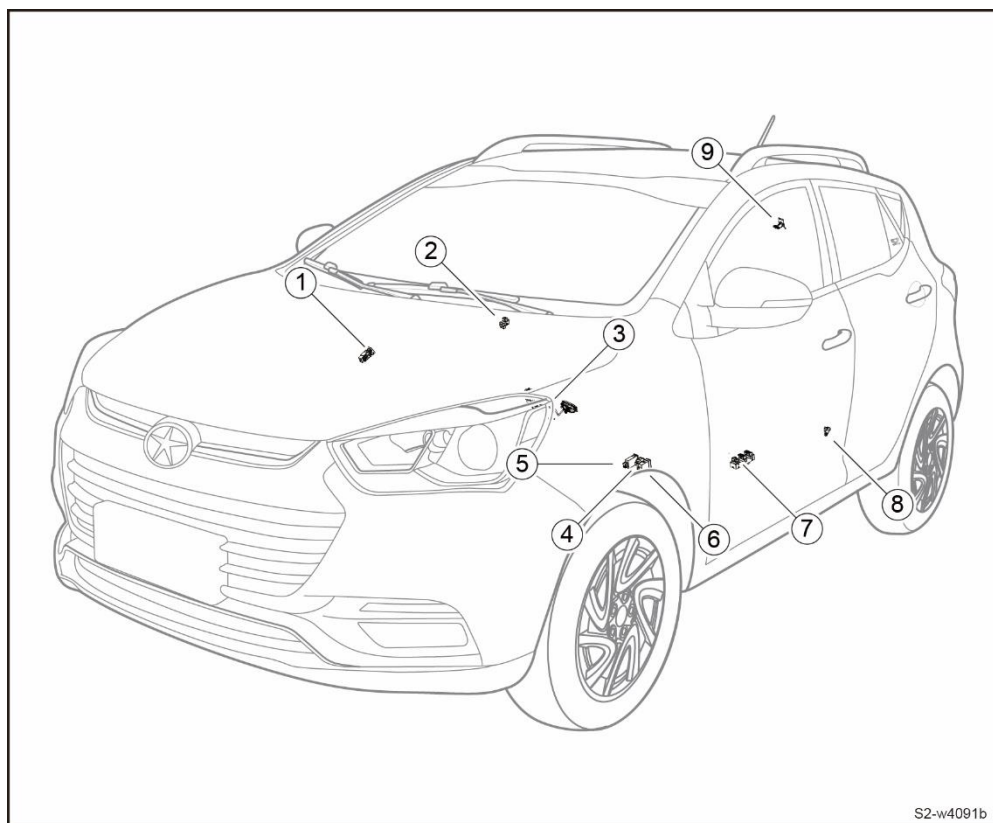


1. Combination switch assembly

2. Clock spring

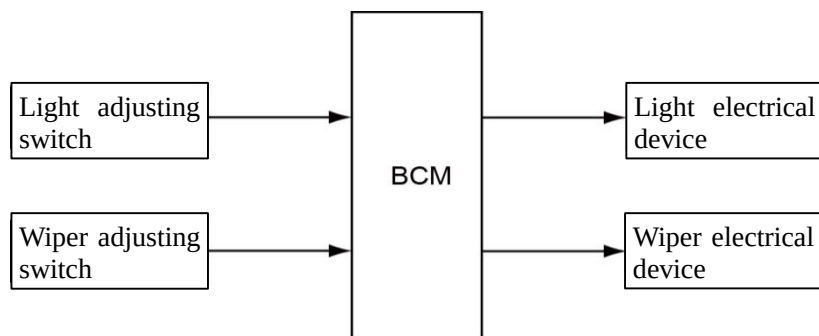
Alternation switch device figure

No	Name	Position
1	Multifunction steering wheel switch	Located in steering wheel
2	Rearview mirror regulating switch	Integrated in lower guard panel of driver's side
3	Window regulator main control switch assembly	Located in left front vehicle door handle panel
4	Window regulator switch	Located in vehicle door handle panel
5	Tail door switch assembly	Located in tail door
6	Warning light assembly	Located in central right side trim panel
7	Headlight height regulating switch	Integrated in lower guard panel of driver's side
8	Light regulating switch	Integrated in lower guard panel of driver's side
9	Door contact switch	Located in vehicle door frame
10	ESP switch	Integrated in lower guard panel of driver's side

Component Position


S2-w4091b

- | | |
|--|--|
| 1. Window regulator switch | 6. Headlight height regulating switch |
| 2. Warning light switch | 7. Window regulator main control switch assembly |
| 3. Multifunction steering wheel switch | 8. Door contact switch |
| 4. Rearview mirror regulating switch | 9. Tail door switch assembly |
| 5. Light regulating switch | |

(II) Operation Principle

(III) Maintenance Note

1. Must disconnect battery negative electrode and waiting for at least 1 min before removing electrical wiring harness connector, or else it may damage vehicle.
2. When disassemble and assemble components, use cloth to protect disassembled components to prevent to be damaged.
3. When disassemble metal clips from trim, use cloth wrap screwdriver blade. Pay attention to not damage vehicle body component.
4. Be careful not to damage vehicle body component.
5. When installing vehicle body trim component, first ensure clips are tightly installed into panel hole of vehicle body, and press them in carefully.
6. When disassemble and assemble some components that one person can't complete, need two person to operate to avoid drop.
7. Please don't use too much power when disassemble some components, because it may cause component deformation.

II、Troubleshooting

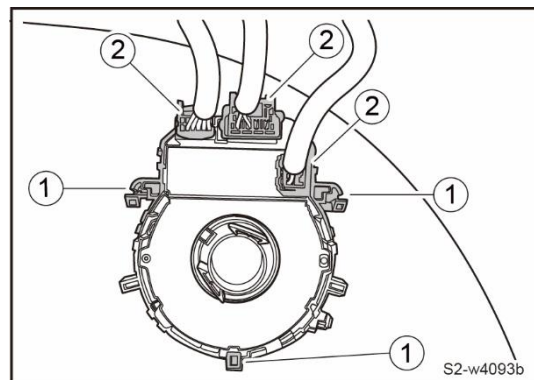
(I) Troubleshooting List

No	Fault phenomenon	Fault reason analysis	Solution	Remark
1	Headlight lose efficacy	Combination switch fault	Replace combination switch	
	Turning light lose efficacy			
	Fog light lose efficacy			
	Turning light not return			
	Wiper regulating lose efficacy			
	Washing lose efficacy			

III、Clock Spring

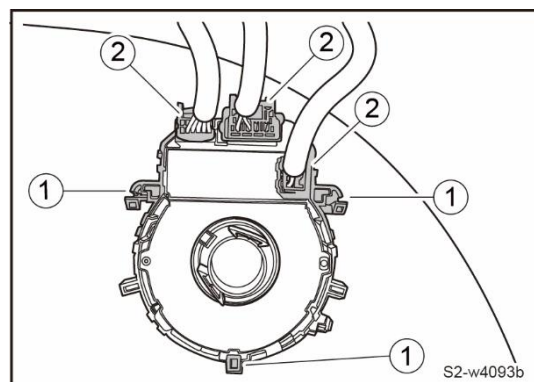
(I) Removal

1. Open engine cabin cover
 2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
 3. Remove driver’s air bag assembly Refer to “driver’s air bag assembly”
 4. Remove steering wheel assembly Refer to “Steering wheel assembly”
 5. Remove upper/lower jacking of steering column Refer to “Steering column jacking”
 6. Remove clock spring
 - 1). Pry 3 clips ① of clock spring, disconnect clock spring wiring harness connector ②, and take down clock spring;
- △ Note Ensure 3 clips is pried off totally, thus can take down clock spring, or else it will damage clock spring.



(II) Installation

1. Install clock spring
 - 1). Connect clock spring wiring harness connector, install clock spring, and ensure clips are connected in place.
 - 2). Ensure direction of front wheel is right ahead, and clock spring is in the middle (turn clockwise to the end, and then turn 3 rings anticlockwise).

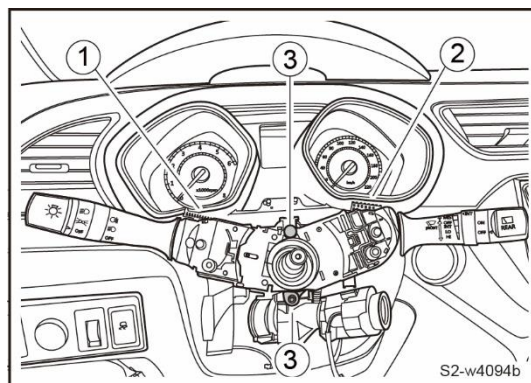


2. Install upper/lower jacketing of steering column
3. Install steering wheel assembly
4. Four-wheel alignment
5. Install driver’s air bag assembly
6. Connect battery negative electrode
7. Close engine cabin cover

IV、Combination Switch

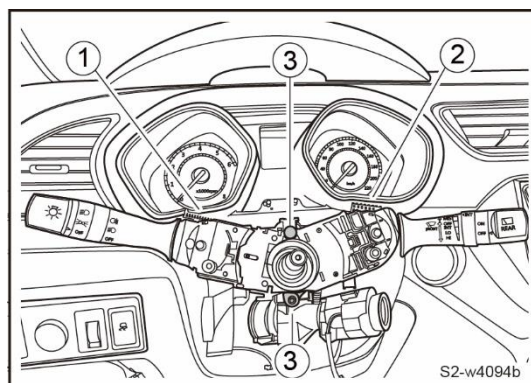
(I) Removal

1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove driver’s air bag assembly Refer to “driver’s air bag assembly”
4. Remove steering wheel assembly Refer to “Steering wheel assembly”
5. Remove upper/lower jacking of steering column Refer to “Steering column jacking”
6. Remove clock spring Refer to “Clock spring”
7. Remove combination switch
 - 1). Disconnect light control switch wiring harness connector ① and wiper control switch wiring harness connector ②;
 - 2). Remove 2 fixed bolts ③ of combination switch, and take down combination switch;



(II) Installation

1. Install combination switch
 - 1). Place combination switch to installation position, and tighten 2 fixed bolts ③;
 - Tighten torque 2 N·m
 - 2). Connect light control switch wiring harness connector ① and wiper control switch wiring harness connector ②;



2. Install clock spring
3. Install upper/lower jacketing of steering column
4. Install steering wheel assembly
5. Four-wheel alignment
6. Install driver’s air bag assembly
7. Connect battery negative electrode
8. Close engine cabin cover

(III) Test

1. Operate light switch operating handle of combination switch to test working condition of all lights and switches:
2. When light operating lever at "OFF", all exterior illumination lights and night illumination lights of electrical devices will off.
3. When light operating lever at small light, vehicle clearance light, front/rear position light, license plate light, dashboard illumination and night illumination lights of electrical devices will on, if in driving condition, side mark light will on at the same time.

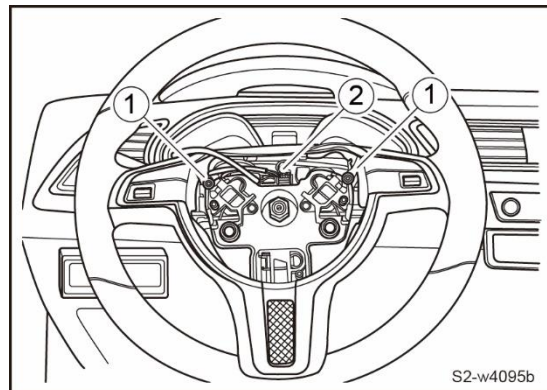
4. Light operating lever at small light, when pressing front(rear) fog light switch, all front(rear) fog light will on.
5. When light operating lever at headlight, headlight low beam on, at the same time all small lights keep in on condition, at this time turn operating lever downward 6 °; headlight high beam on, turn operating lever back and turn operating lever upward 6 °; high beam on instantly, switch return automatically after loosening the operating lever.
6. Turn light operating lever front(rear) 15 °; all right(left) turning light will start twinkle, at the same time right(left) turning indicating light on dashboard will twinkle, if turn back operating lever, light will stop twinkling. Turn operating lever front (rear) 9 °; right (left) turning light turns on instantly, switch return automatically after loosening the operating lever.
7. Press warning switch, all turning light will twinkle at the same time, at the same time right(left) turning indicating light on dashboard will twinkle.
8. Operating combination switch wiper/washer, detect working condition of wiper and washer:
 - 1). When operating lever at "OFF", wiper and washer not work.
 - 2). When operating lever at "INT", wiper rod will intermittently work for a certain time interval.
 - 3). Rotate intermittent time adjusting button, making time change between "FAST" and "SLOW", intermittent time of wiper rod working will change.
 - 4). When operating lever at "LO", wiper rod will work in low speed.
 - 5). When operating lever at "HI", wiper rod will work in high speed.
 - 6). Press washing button at the bottom of handle when wiper is working at the same time, turn combination switch right control handle to the body in the shifting direction of 6.5 °; washer nozzle will spray washing liquid to front windshield.

V、Multifunction Steering Wheel Switch

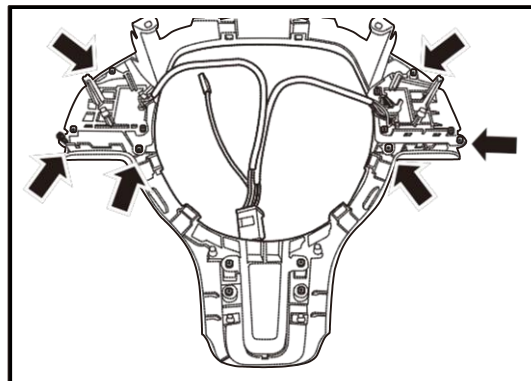
(I) Removal

1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove driver’s air bag assembly Refer to “driver’s air bag assembly”
4. Remove multifunction steering wheel switch

- 1). Remove 2 fixed bolts ① of multifunction steering wheel switch trim cover and steering wheel assembly;
- 2). Disconnect wiring harness connector ② of multifunction steering wheel switch;

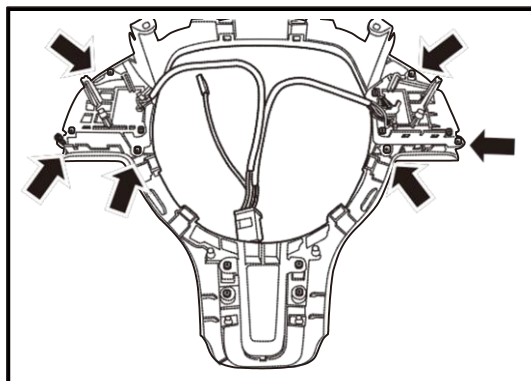


- 3). Pry multifunction steering wheel switch trim cover, remove 6 fixed bolts of multifunction steering wheel switch and trim cover, and take down multifunction steering wheel switch;

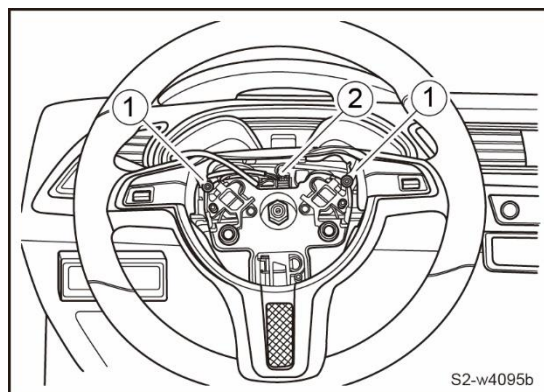


(II) Installation

1. Install multifunction steering wheel switch
 - 1). Install multifunction steering wheel switch to trim cover, and tighten 6 fixed bolts;



- 2). Install multifunction steering wheel switch trim cover, and tighten 2 fixed bolts ①;
- 3). Connect wiring harness connector ② of multifunction steering wheel switch;

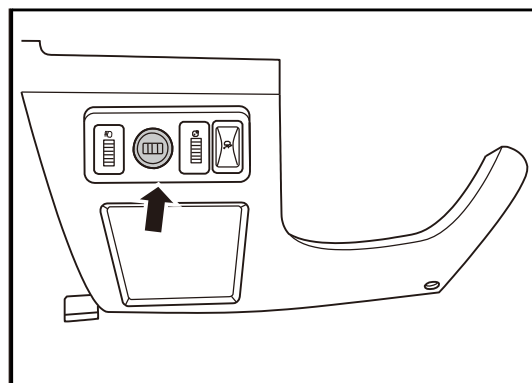


2. Install driver’s air bag assembly
3. Connect battery negative electrode
4. Close engine cabin cover

VI、Rearview Mirror Regulating Switch

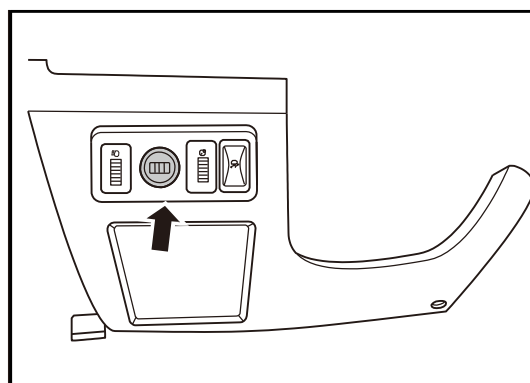
(I) Removal

1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove left front door threshold guard panel assembly Refer to “Left front door threshold guard panel assembly”
4. Remove left front side vehicle door frame rubber strip Refer to “Vehicle door frame rubber strip”
5. Remove lower trim panel of A pillar Refer to “Lower trim panel of A pillar”
6. Remove dashboard left end cover Refer to “Dashboard left end cover”
7. Remove lower guard panel assembly of driver’s side Refer to “Lower guard panel assembly of driver’s side”
8. Remove rearview regulating switch
 - 1). Disconnect jack catch of rearview regulating switch and lower guard panel assembly of driver’s side, and take down rearview regulating switch from behind side;



(II) Installation

1. Install rearview regulating switch
 - 1). Install rearview regulating switch from behind side, and ensure jack catch is connected in place;

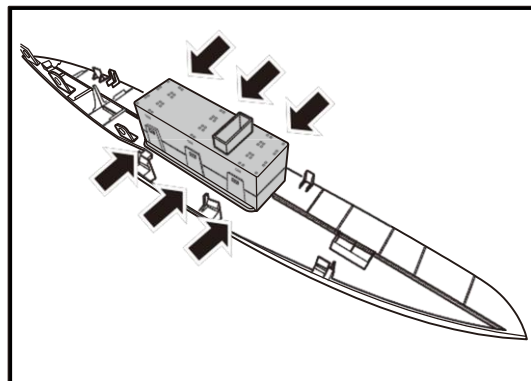


2. Install lower guard panel assembly of driver’s side
3. Install dashboard left end cover
4. Install lower trim panel of A pillar
5. Install left front side vehicle door frame rubber strip
6. Install left front door threshold guard panel assembly
7. Connect battery negative electrode
8. Close engine cabin cover

VII、 Window Regulator Main Control Switch Assembly

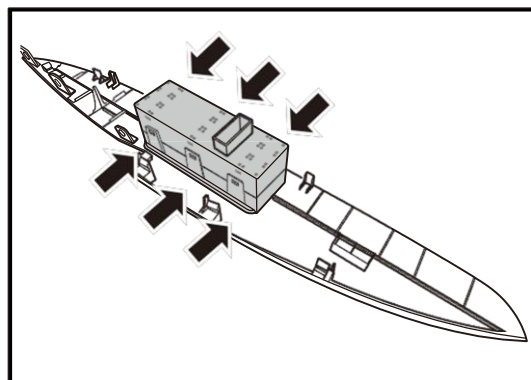
(I) Removal

1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove left front door inclined handle Refer to “Front door inclined handle”
4. Remove left front door handle Refer to “Right door handle”
5. Remove window regulator main control switch assembly
 - 1). Pry 6 buckles of window regulator main control switch assembly, disconnect connection of window regulator main control switch assembly and switch panel, and take down window regulator main control switch assembly;



(II) Installation

1. Install window regulator main control switch assembly
 - 1). Install window regulator main control switch assembly to left front door switch panel, and ensure to be installed in place;
△ Note Check whether all buttons function are normal after installing. If not or can't work, please re-install or replace.

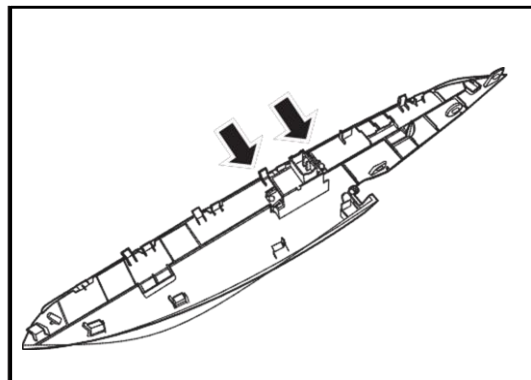


2. Install left front door handle
3. Install left front door inclined handle
4. Connect battery negative electrode
5. Close engine cabin cover

VIII、Window Regulator Switch

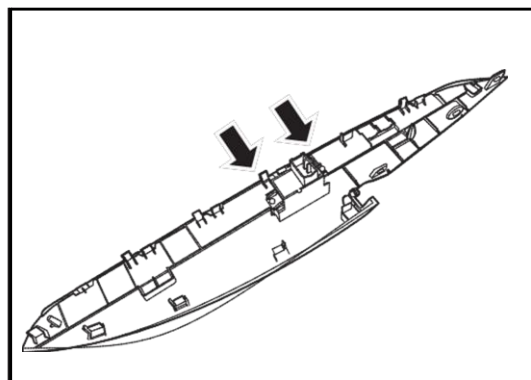
(I) Removal

1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove right front door inclined handle Refer to “Front door inclined handle”
4. Remove right front door handle Refer to “Right door handle”
5. Remove window regulator switch
 - 1). Remove 2 fixed bolts of window regulator switch;
 - 2). Take down window regulator switch;



(II) Installation

1. Install window regulator switch
 - 1). Place window regulator switch to installation position, and tighten 2 fixed bolts of window regulator switch;

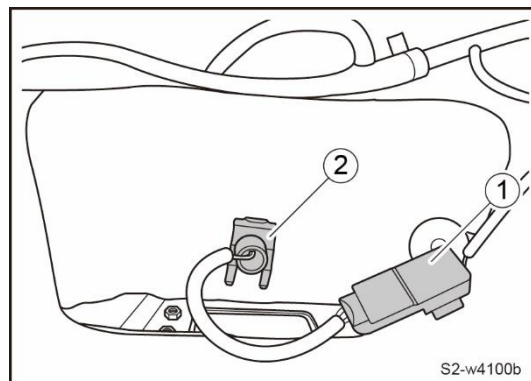


2. Install right front door handle
3. Install right front door inclined handle
4. Connect battery negative electrode
5. Close engine cabin cover

IX、Tail Door Switch Assembly

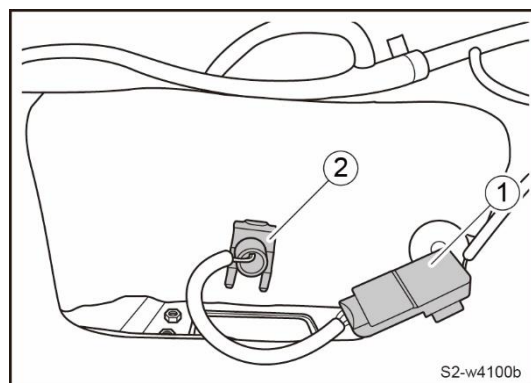
(I) Removal

1. Open rear tail door
2. Open engine cabin cover
3. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
4. Remove tail door trim panel assembly Refer to “Tail door trim panel assembly”
5. Remove tail door switch assembly
 - 1). Disconnect wiring harness connector ① of tail door switch;
 - 2). Remove fixed bracket ② of tail door switch assembly;
 - 3). Take down tail door switch assembly from outside vehicle;



(II) Installation

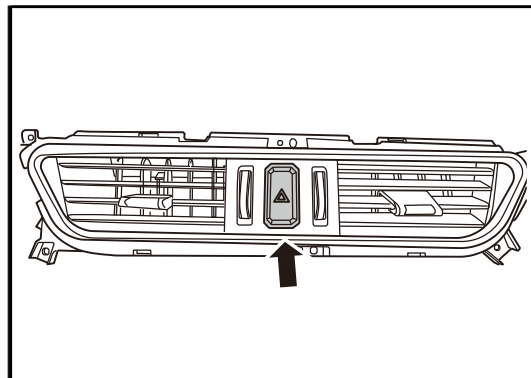
1. Install tail door switch assembly
 - 1). Place tail door switch assembly to installation hole, and install fixed bracket ② of tail door switch assembly;
 - 2). Connect wiring harness connector ① of tail door switch assembly;
2. Install tail door trim panel assembly
3. Close rear tail door
4. Connect battery negative electrode
5. Close engine cabin cover



X、Warning Light Switch

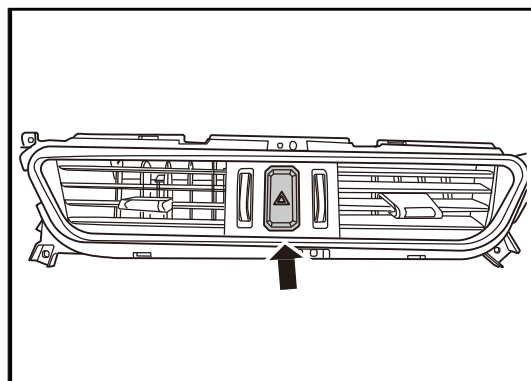
(I) Removal

1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove central right side trim panel assembly Refer to “Central right side trim panel assembly”
4. Remove warning light switch
 - 1). Disconnect jack catch of warning light switch and central right side trim panel assembly, and take down warning light switch from front side;



(II) Installation

1. Install warning light switch
 - 1). Install warning light switch from front side, and ensure jack catch is installed in place;

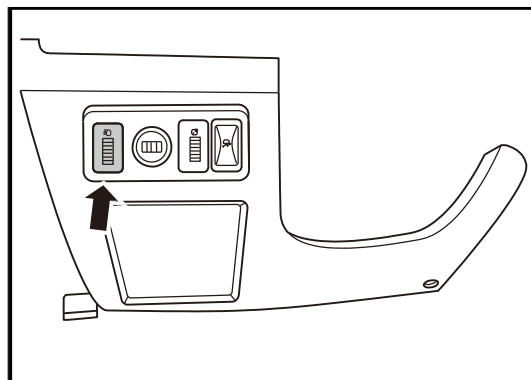


2. Install central right side trim panel assembly
3. Connect battery negative electrode
4. Close engine cabin cover

XI、Headlight Height Regulating Switch

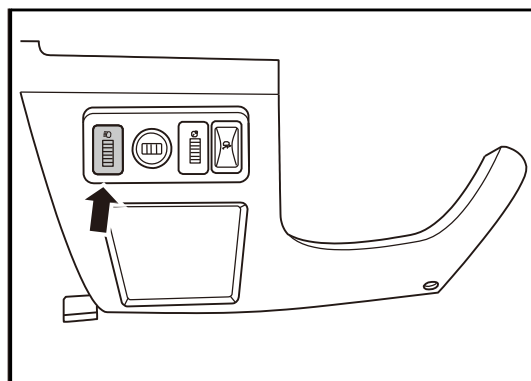
(I) Removal

1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove left front door threshold guard panel assembly Refer to “Left front door threshold guard panel assembly”
4. Remove left front side vehicle door frame rubber strip Refer to “Vehicle door frame rubber strip”
5. Remove lower trim panel of A pillar Refer to “Lower trim panel of A pillar”
6. Remove dashboard left end cover Refer to “Dashboard left end cover”
7. Remove lower guard panel assembly of driver’s side Refer to “Lower guard panel assembly of driver’s side”
8. Remove headlight height regulating switch
 - 1). Disconnect jack catch of headlight height regulating switch and lower guard panel assembly of driver’s side, and take down headlight height regulating switch from front side;



(II) Installation

1. Install headlight height regulating switch
 - 1). Install headlight height regulating switch in front, and ensure jack catch is connected in place;

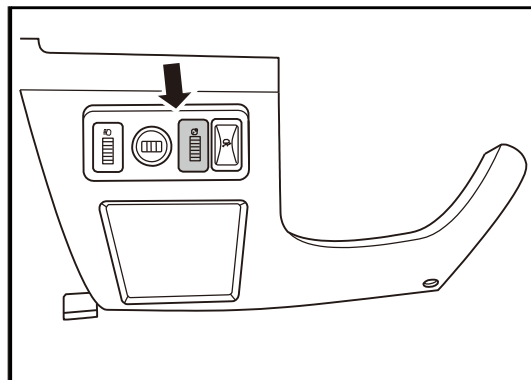


2. Install lower guard panel assembly of driver’s side
3. Install dashboard left end cover
4. Install lower trim panel of A pillar
5. Install left front side vehicle door frame rubber strip
6. Install left front door threshold guard panel assembly
7. Connect battery negative electrode
8. Close engine cabin cover

XII、Light Regulating Switch

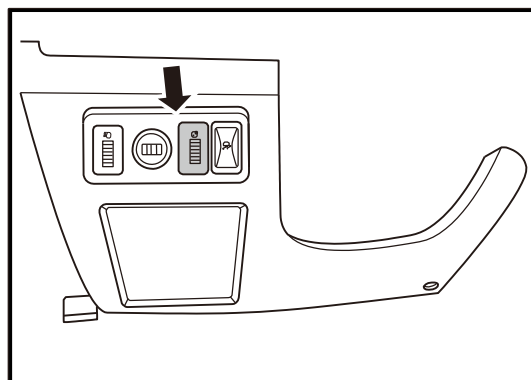
(I) Removal

1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove left front door threshold guard panel assembly Refer to “Left front door threshold guard panel assembly”
4. Remove left front side vehicle door frame rubber strip Refer to “Vehicle door frame rubber strip”
5. Remove lower trim panel of A pillar Refer to “Lower trim panel of A pillar”
6. Remove dashboard left end cover Refer to “Dashboard left end cover”
7. Remove lower guard panel assembly of driver’s side Refer to “Lower guard panel assembly of driver’s side”
8. Remove light regulating switch
 - 1). Disconnect jack catch of light regulating switch and lower guard panel assembly of driver’s side, and take down light regulating switch;



(II) Installation

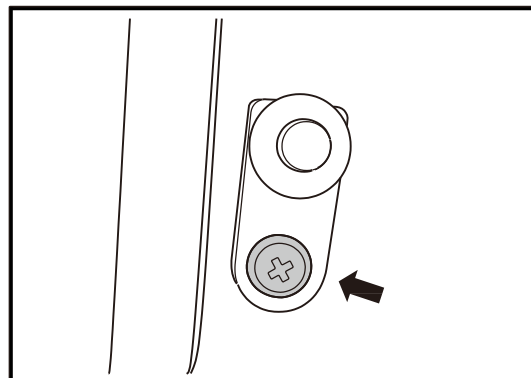
1. Install light regulating switch
 - 1). Install light regulating switch in front, and ensure jack catch is connected in place;
2. Install lower guard panel assembly of driver’s side
3. Install dashboard left end cover
4. Install lower trim panel of A pillar
5. Install left front side vehicle door frame rubber strip
6. Install left front door threshold guard panel assembly
7. Connect battery negative electrode
8. Close engine cabin cover



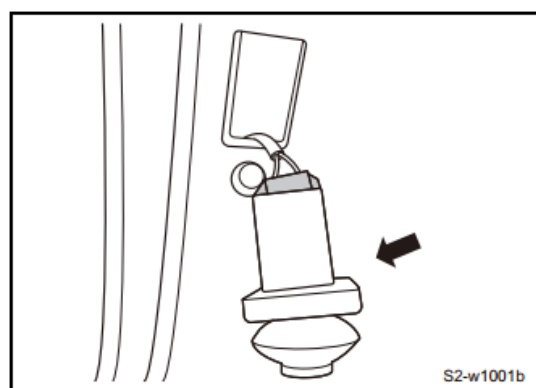
XIII、Door Contact Switch

(I) Removal

1. Open engine cabin cover
2. Disconnect battery negative electrode
3. Remove door contact switch
 - 1). Remove fixed bolt of door contact switch;

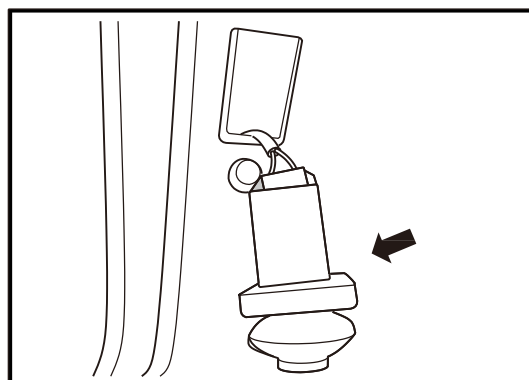


- 2). Disconnect wiring harness connector of door contact switch, and take down door contact switch;

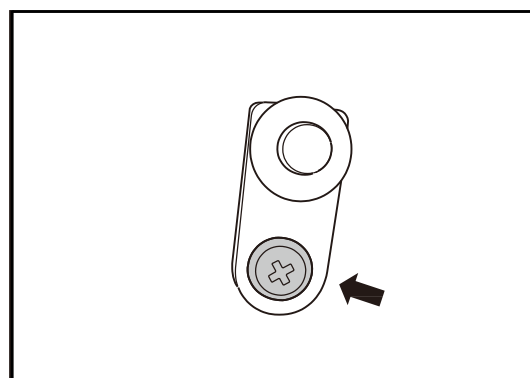


(II) Installation

1. Install door contact switch
 - 1). Connect wiring harness connector of door contact switch, and place door contact switch to installation position hole;



- 2). Tighten fixed bolt of door contact switch;
Tighten torque 9~11N m

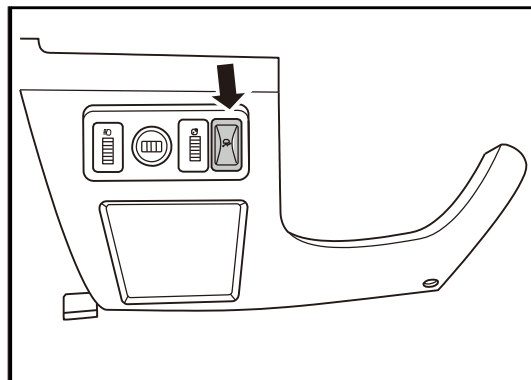


2. Connect battery negative electrode
3. Close engine cabin cover

XIV、ESP Switch

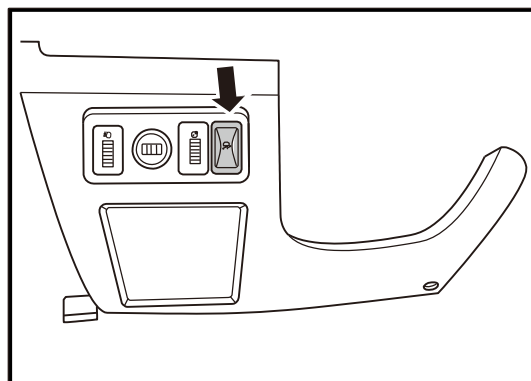
(I) Removal

1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove left front door threshold guard panel assembly Refer to “Left front door threshold guard panel assembly”
4. Remove left front side vehicle door frame rubber strip Refer to “Vehicle door frame rubber strip”
5. Remove lower trim panel of A pillar Refer to “Lower trim panel of A pillar”
6. Remove dashboard left end cover Refer to “Dashboard left end cover”
7. Remove lower guard panel assembly of driver’s side Refer to “Lower guard panel assembly of driver’s side”
8. Remove ESP switch
 - 1). Disconnect jack catch of ESP switch and lower guard panel assembly of driver’s side, and take down ESP switch;



(II) Installation

1. Install ESP switch
 - 1). Install ESP switch in front, and ensure jack catch is connected in place.



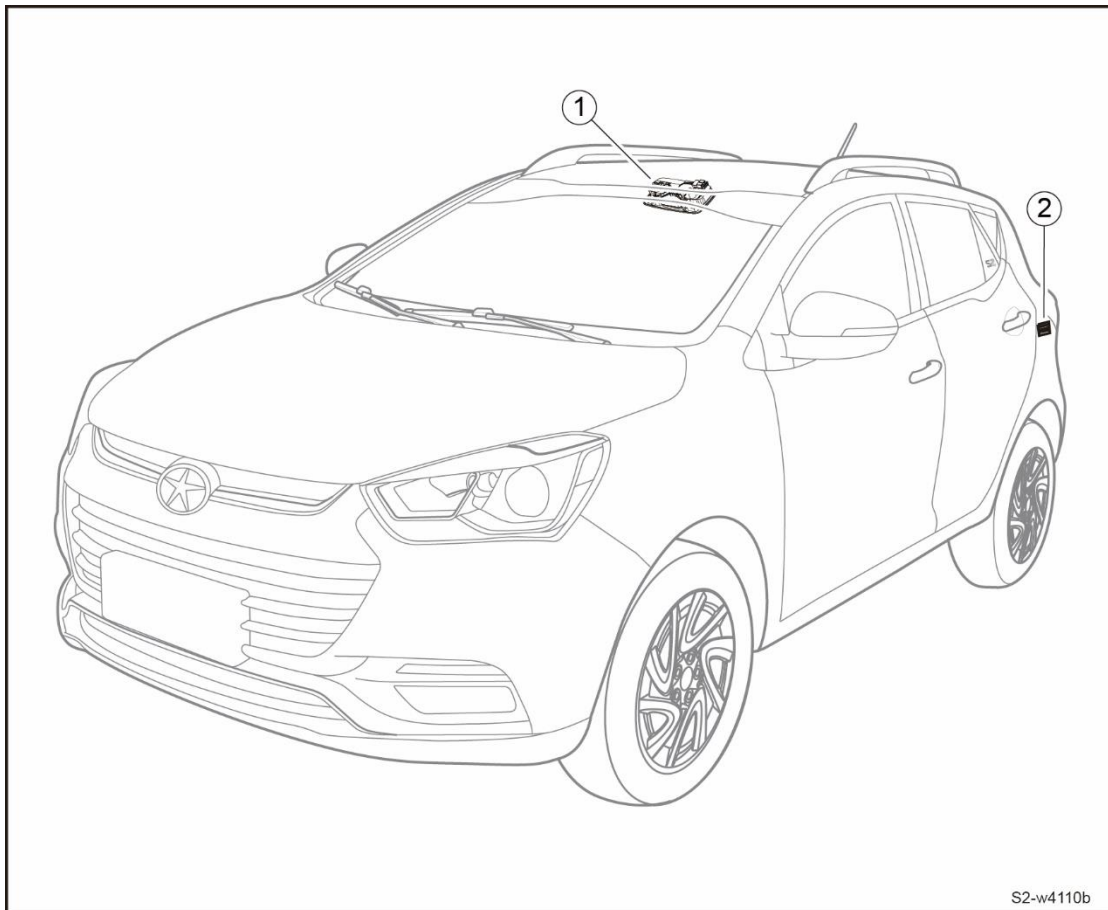
2. Install lower guard panel assembly of driver’s side
3. Install dashboard left end cover
4. Install lower trim panel of A pillar
5. Install left front side vehicle door frame rubber strip
6. Install left front door threshold guard panel assembly
7. Connect battery negative electrode
8. Close engine cabin cover

Illumination System

I、Summary

(I) Structure Overview

Interior illumination component position figure

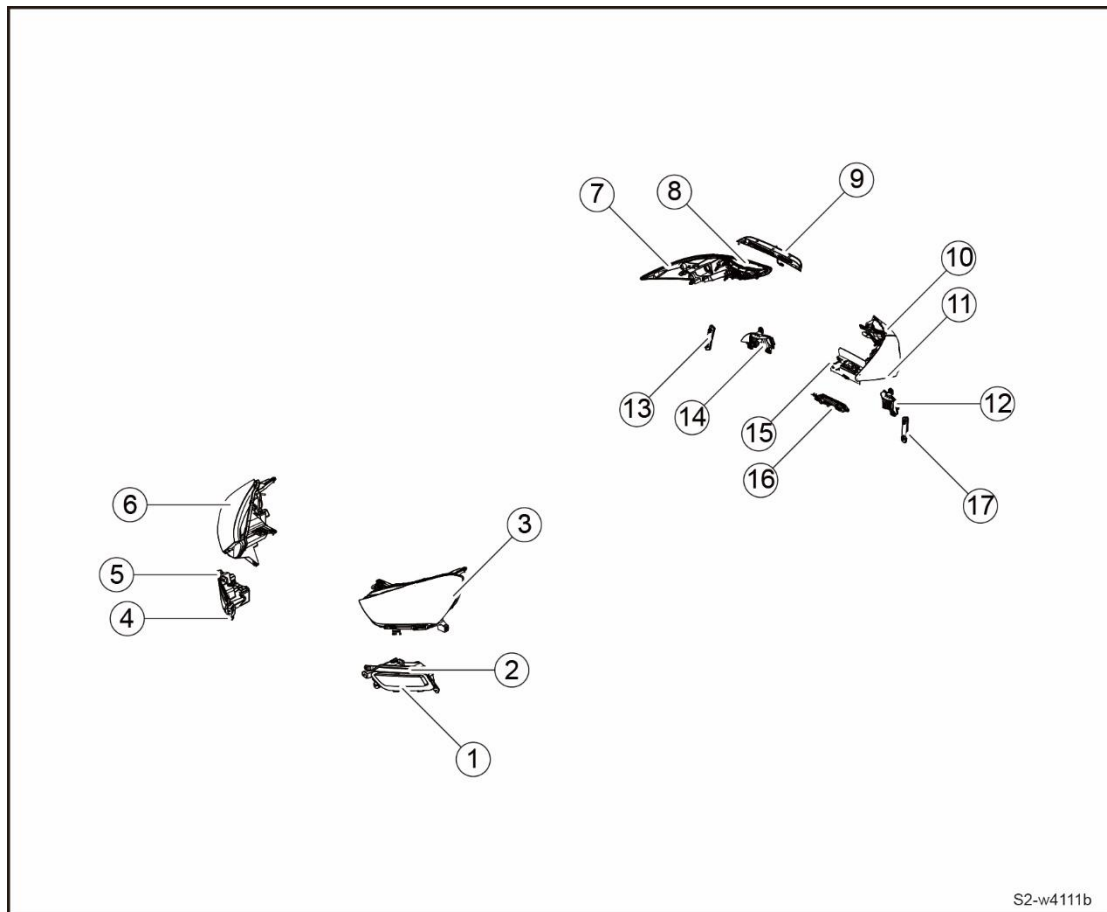


1. Front top light

2. Trunk light

S2-w4110b

Exterior illumination component position figure

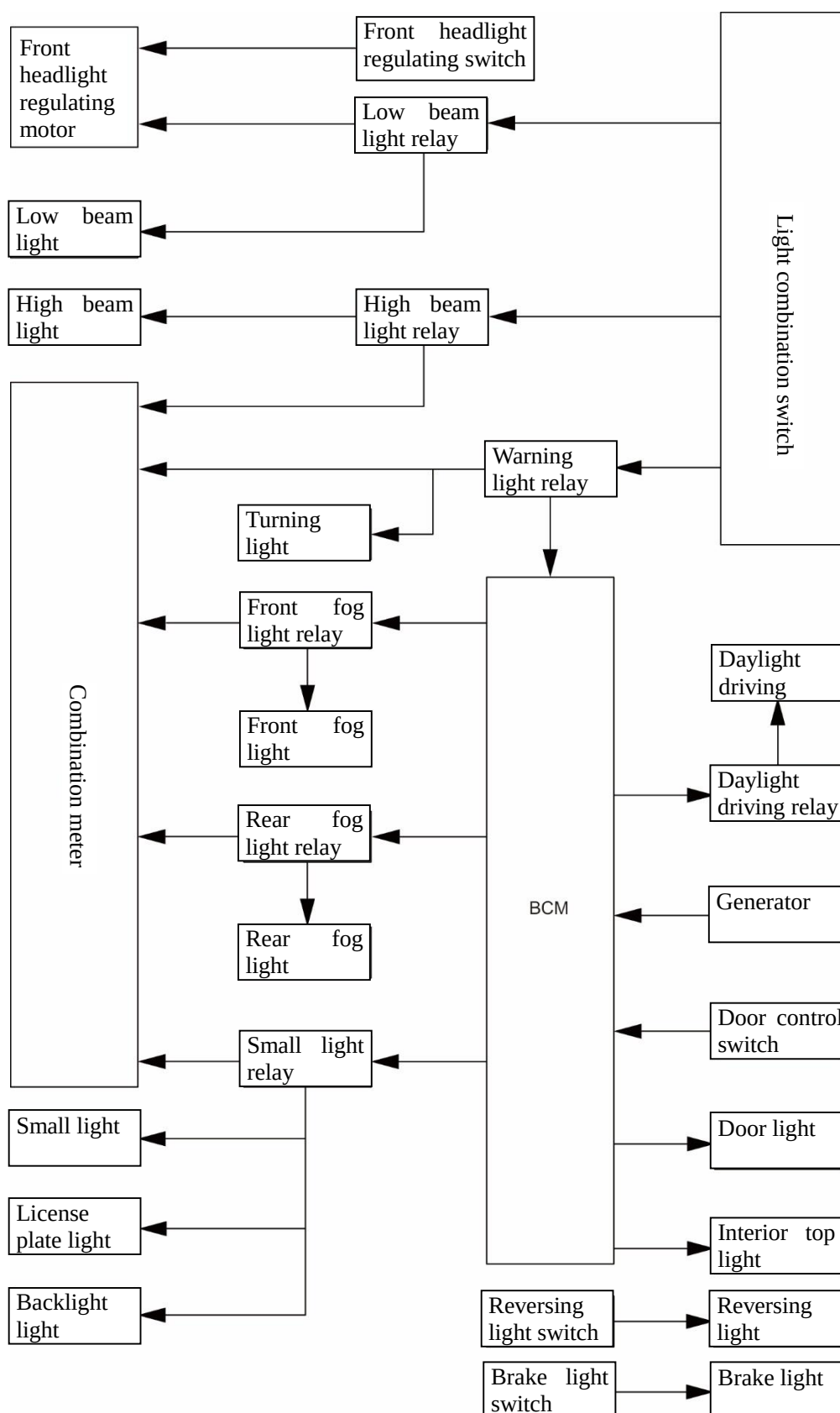


1. Left front fog light
2. Left daylight driving light
3. Left front combination light
4. Right front fog light
5. Right daylight driving light
6. Right front combination light
7. Right rear side wall combination light
8. Right rear tail door combination light
9. High position brake light

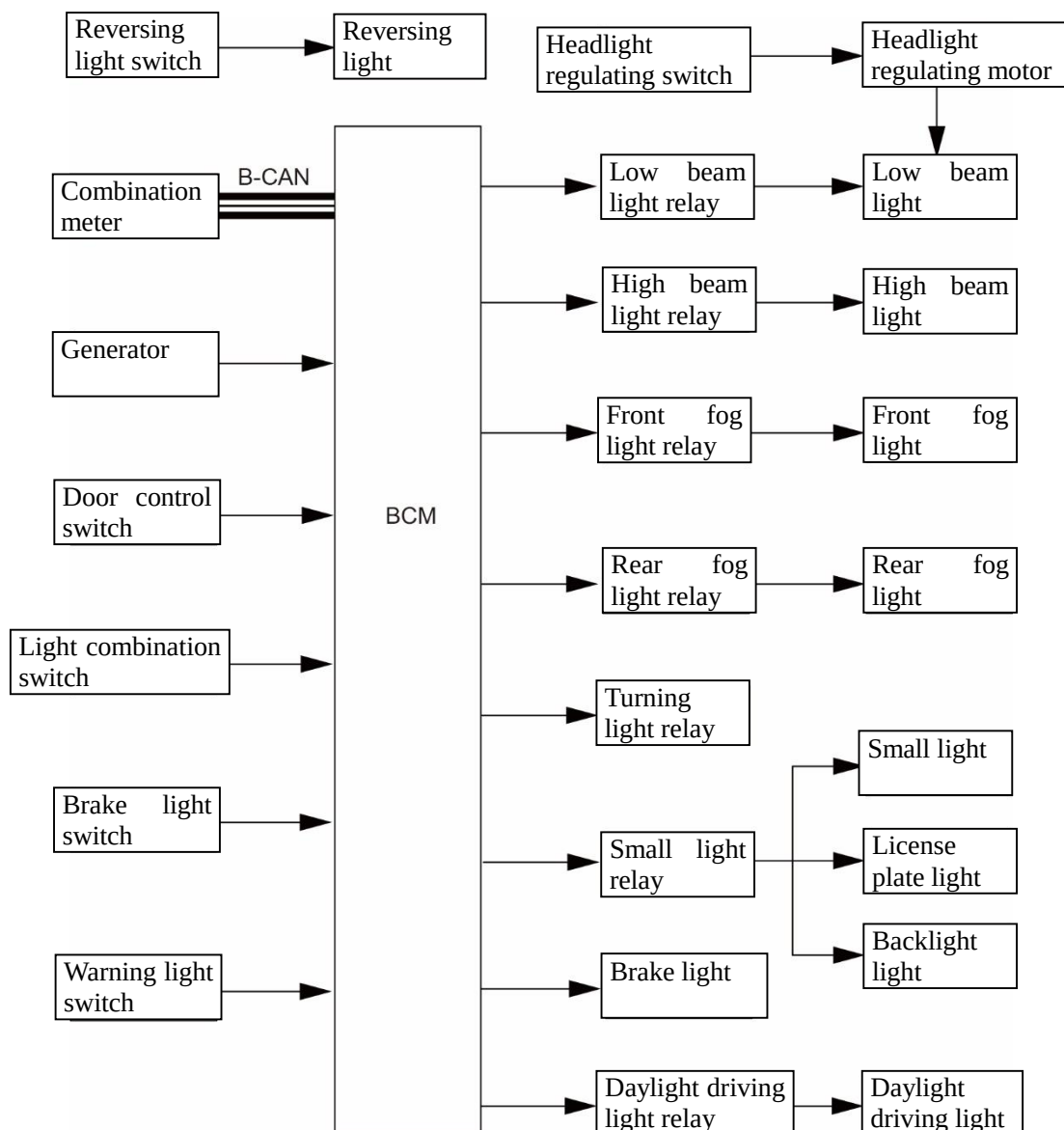
10. Left rear tail door combination light
11. Left rear side wall combination light
12. Left reversing light
13. Right rear reflector
14. Right reversing light
15. License plate light
16. Rear fog light
17. Left rear reflector

(II) Operation Principle

Electrical schematic diagram (vehicle type without CAN)



Electrical schematic diagram (vehicle type with CAN)



(III) Technical Parameter

No.	Name	Light bulb type	Power	Light color
1	High beam light	H7	2×55W	White
2	Low beam light	H7	2×55W	White
3	Front turning light	PY21W	2×21W	Amber
4	Front position light	W5W	2×5W	White
5	Front fog light	H8	2×35W	White
6	Daylight driving light	LED	2×5.6W	White
7	Rear position light/Brake light	P21/5W	2×21W+2×5W	Red
8	Rear turning light	P21W	2×21W	Amber
9	Rear position light	W5W	2×5W	White
10	Rear fog light	LED	5.6W	Red
11	Reversing light	P21W	2×21W	White

No.	Name	Light bulb type	Power	Light color
12	License plate light	W5W	2×5W	White
13	High position brake light	LED	1.7W	Red
14	Front top light	C10W	2×10W	White
15	Trunk light	KHA	5W	White

(IV) Torque Parameter

No.	Item	Torque (N m)
1	Front combination light fixed bolt	3~5
2	Front fog light fixed bolt	1~3
3	Daylight driving light	1~3

(V) Maintenance Note

1. Must disconnect battery negative electrode and waiting for at least 1 min before removing electrical wiring harness connector, or else it may damage vehicle.
2. When disassemble and assemble components, use cloth to protect disassembled components to prevent to be damaged.
3. When disassemble metal clips from trim, use cloth wrap screwdriver blade. Pay attention to not damage vehicle body component.
4. When disassemble and assemble some components that one person can't complete, need two person to operate to avoid drop.
5. Please don't use too much power when disassemble some components, because it may cause component deformation.
6. Don't let light bulb and rear cover disassemble too long time from light, because dust, moisture, fog etc. Entering into light may infect light function. After disassemble light bulb in front combined light reflecting shade, please install new light bulb.
7. Light combination light is semi-closed type, and use replaceable halogen light bulb. Replacing light bulb can be operated in engine cabin, but it's better to replace after removing.
8. Don't touch window casing, and only can handle plastic seat of light bulb when operating light bulb.
9. Don't shake or turn light bulb when removing.

II、Troubleshooting

(I) Troubleshooting List

No.	Fault phenomenon	Fault reason analysis	Solution	Remark
1	Front headlight, fog light, small light, turning light not work	Light filament fused	Replace light bulb	Refer to light not work(front headlight, fog light, small light, turning light)
		Fuse fused	Replace fuse	
		Power supply not connected, wiring harness connector loosen	Maintain circuit fault	
		Relay not work	Replace relay	
		Light switch not work	Replace light switch	
		Light switch circuit fault	Maintain light switch circuit fault	
		BCM fault	Replace BCM	
2	Reversing light not work	Reversing light fuse fused	Replace fuse	Refer to reversing light not work
		Reversing switch installation incorrect	Adjust to install reversing light switch	
		Reversing switch damaged	Replace reversing light switch	
		Reversing light filament fused	Replace light bulb	
3	Brake light not work	Brake light fuse fused	Replace brake light fuse	Refer to brake light not work
		Brake switch installation incorrect	Adjust to install brake switch	
		Brake switch damaged	Replace brake light switch	
		Brake light filament fused	Replace light bulb	

(II) Illumination system fuse, relay, wiring harness connector list

No.	Light	Fuse	Relay	Wiring harness connector and PIN
1	Left low beam light	IF16 20A	IR03	E05-8
2	Right low beam light			E20-8
3	Left high beam light	IF17 15A	IR04	E05-10
4	Right high beam light			E20-10
5	Left front position light	IF04 10A	IR08	E05-7
6	Left rear position light			E09-6
7	Left rear inside position light			T12-1
8	Left license plate light			RB02-1
9	Right front position light	IF04 10A		E20-7
10	Right rear position light			F28-6
11	Right rear inside position light			T17-1
12	Right license plate light			RB05-1
13	Left front turning light	\	\	E05-2

No.	Light	Fuse	Relay	Wiring harness connector and PIN
14	Left side turning light			D02-1
15	Left rear turning light			F09-4
16	Right front turning light			E20-2
17	Right side turning light			D11-1
18	Right rear turning light			F28-4
19	Reversing light	IF20 10A	\	RB01-1/RB08-1
20	Reversing light switch			C24
21	Left brake light	\	\	F09-5
22	Right brake light			F28-5
23	High position brake light			T01-1
24	Brake light switch	\	\	E11
25	Left front fog light	IF07 15A	IR10	E03-1
26	Right front fog light			E23-1
27	Rear fog light	IF38 10A	IR09	RB04-1

(III) Troubleshooting Flow Chart

Front headlight, fog light, turning light not working

Step	Detect content	Solution	Judging specification	Next step	
				Yes	No
1	Confirm fault phenomenon	Ignition switch at relevant position, light switch turn to relevant light position	Whether relevant light is on	Next step	Turn to step 3
2	Check intermittent fault	Check and deal with relevant wiring harness connector loosen condition			
3	Check relevant light fuse	Remove relevant light fuse	Whether fuse is fused	Replace fuse, turn to next step	Turn to step 5
4	Check whether fault is removed after replacing fuse	Turn Light switch to relevant light position	Whether relevant light is on	Fault is removed	Next step
5	Check relevant light bulb	Dismount light bulb, check filament	Whether filament is fused	Replace relevant light bulb, turn to next step	Turn to step 7
6	Check whether fault is removed after replacing relevant light bulb	Turn Light switch to relevant light position	Whether relevant light is on	Fault is removed	Next step

Step	Detect content	Solution	Judging specification	Next step	
				Yes	No
7	Check relevant light power supply	Measure voltage between relevant wiring harness connector pin and grounding by multimeter	Voltage standard value: 11~14 V Whether voltage accord with standard	Next step	Turn to step 9
8	Check relevant light grounding circuit	Measure resistance between relevant wiring harness connector pin and grounding by multimeter	Resistance standard value: less than 1Ω Whether resistance accord with standard	Next step	Check and maintain or replace wiring harness
9	Check relay output power supply	Measure voltage between relevant wiring harness connector pin and grounding by multimeter	Voltage standard value: 11~14 V Whether voltage accord with standard	Next step	Turn to step 11
10	Check relevant light wiring harness connector pin to relay circuit	Measure resistance between light relevant wiring harness connector and relay by multimeter	Resistance standard value: less than 1Ω Whether resistance accord with standard	Next step	Check and maintain or replace wiring harness
11	Check relay input power supply	Measure voltage between relevant wiring harness connector pin and grounding by multimeter	Voltage standard value: 11~14 V Whether voltage accord with standard	Next step	Check and maintain or replace electrical box
12	Check whether fault is removed after replacing relevant relay	Turn Light switch to relevant light position	Whether relevant light is on	Fault is removed	Next step
13	Check circuit from relevant relay to BCM	Measure resistance between light relevant wiring harness connector and relay by multimeter	Resistance standard value: less than 1Ω Whether resistance accord with standard	Next step	Check and maintain or replace wiring harness
14	Check circuit from light switch to BCM	Measure resistance between light relevant wiring harness connector and light switch by multimeter	Resistance standard value: less than 1Ω Whether resistance accord with standard	Next step	Check and maintain or replace wiring harness
15	Replace light switch, whether fault is removed	Replace new light switch, turn Light switch to relevant light position	Whether light is on	Fault removed	Next step
16	Replace BCM, whether fault is removed	Turn Light switch to relevant light position	Whether relevant light is on	Fault is removed	

Reversing light not working

Step	Detect content	Solution	Judging specification	Next step	
				Yes	No
1	Confirm fault phenomenon	Turn ignition switch to ON, transmission turn to reversing position	Whether reversing light is on	Next step	Turn to step 3

Step	Detect content	Solution	Judging specification	Next step	
				Yes	No
2	Check intermittent fault	Check and deal with relevant wiring harness connector loosen condition			
3	Check reversing light fuse	Remove reversing light fuse	Whether fuse is fused	Replace fuse, turn to next step	Turn to next step
4	Check whether fault is removed after replacing fuse	Turn ignition switch to ON, transmission turn to reversing position	Whether reversing light is on	Fault removed	Next step
5	Check reversing light bulb	Remove reversing light bulb, check filament	Whether filament is fused	Replace reversing light bulb, turn to next step	Turn to step 7
6	Check whether fault is removed after replacing reversing light bulb	Turn ignition switch to ON, transmission turn to reversing position	Whether reversing light is on	Fault removed	Next step
7	Check reversing light power supply	Measure voltage between reversing wiring harness connector pin and grounding by multimeter	Voltage standard value: 11~14 V Whether voltage accord with standard	Next step	Turn to step 9
8	Check reversing light grounding circuit	Measure resistance between reversing light wiring harness connector pin and grounding by multimeter	Resistance standard value: less than 1Ω Whether resistance accord with standard	Next step	Check and maintain or replace wiring harness
9	Check reversing light to reversing light switch circuit	Measure resistance between reversing light wiring harness connector and reversing light switch by multimeter	Resistance standard value: less than 1Ω Whether resistance accord with standard	Next step	Check and maintain or replace wiring harness
10	Check reversing light switch to reversing light fuse circuit	Measure resistance between reversing light switch wiring harness connector and reversing light fuse by multimeter	Resistance standard value: less than 1Ω Whether resistance accord with standard	Next step	Check and maintain or replace wiring harness
11	Replace reversing light switch, check whether fault is removed	Replace faulted reversing light switch, turn ignition switch to ON, turn to reversing gear	Whether reversing light is on	Fault removed	

Brake light not working

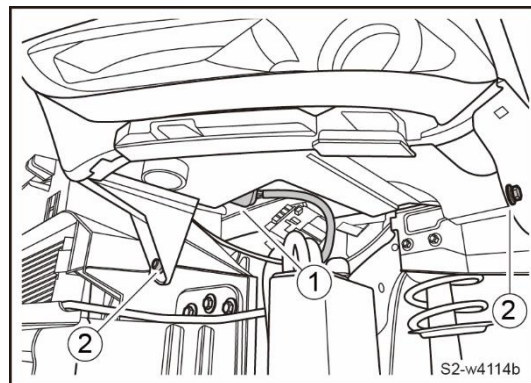
Step	Detect content	Solution	Judging specification	Next step	
				Yes	No
1	Confirm fault phenomenon	Turn ignition switch to OFF, step brake pedal	Whether brake light is on	Deal with intermittent fault, turn to next step	Turn to step 3
2	Check intermittent fault	Check and deal with brake light wiring harness connector loosen condition			

Step	Detect content	Solution	Judging specification	Next step	
				Yes	No
3	Check brake light fuse	Remove brake light fuse	Whether fuse is fused	Replace brake light fuse, turn to next step	Turn to step 5
4	Check whether fault is removed after replacing fuse	Turn ignition switch to OFF, step brake pedal	Whether brake light is on	Fault is removed	Next step
5	Check brake light bulb	Dismount brake light bulb, check filament	Whether filament is fused	Replace reversing light bulb	Turn to step 7
6	whether fault is removed after replacing brake light bulb	After replacing light bulb, turn ignition switch to OFF, press brake pedal	Whether brake light is on	Fault removed	Next step
7	Check brake light power supply	Press brake pedal, measure voltage between brake light wiring harness connector pin and grounding by multimeter	Voltage standard value: 11~14 V Whether voltage accord with standard	Next step	Turn to step 9
8	Check brake light grounding circuit	Measure resistance between brake light wiring harness connector and grounding by multimeter	Resistance standard value: less than 1Ω Whether resistance accord with standard	Next step	Check and maintain or replace wiring harness
9	Check brake light to brake light switch circuit	Measure resistance between brake light wiring harness connector and brake light switch by multimeter	Resistance standard value: less than 1Ω Whether resistance accord with standard	Next step	Check and maintain or replace wiring harness
10	Check brake light switch to brake light fuse circuit	Measure resistance between brake light switch wiring harness connector and brake light fuse by multimeter	Resistance standard value: less than 1Ω Whether resistance accord with standard	Next step	Check and maintain or replace wiring harness
11	Replace reversing light switch	Replace faulted brake light switch, turn ignition switch to ON, turn to reversing gear	Whether brake light is on	Fault removed	

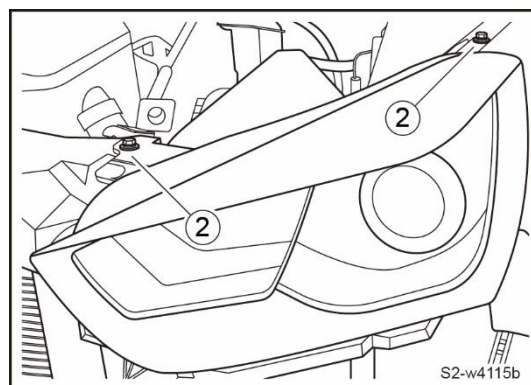
III、Front Combination Light Assembly

(I) Removal

1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove front guard cover of engine Refer to “Front guard cover of engine”
4. Remove front wheel cover Refer to “Front wheel cover”
5. Remove upper cover plate of front bumper
6. Remove front bumper assembly
7. Remove front combination light assembly
 - 1). Disconnect wiring harness connector ① of front combination light assembly;
 - 2). Remove 4 fixed bolts ② of front combination light assembly;



- 3). Take down front combination light assembly;

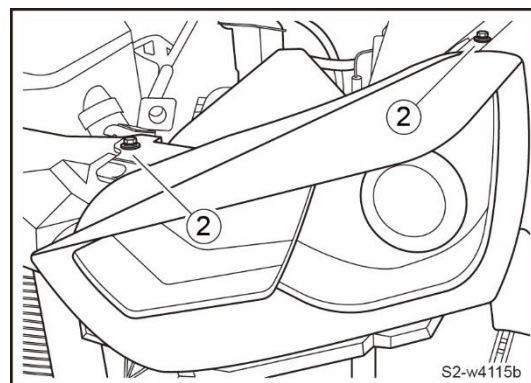


(II) Installation

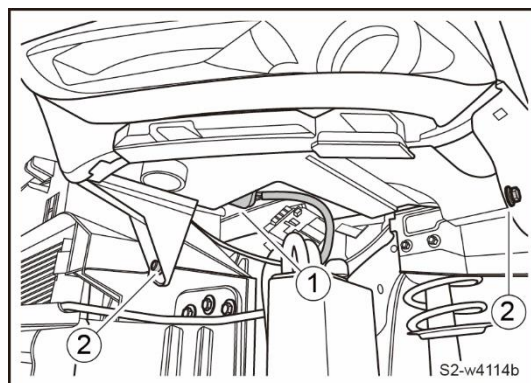
1. Install front combination light assembly
 - 1). Place front combination light assembly to installation position, and tighten 4 fixed bolts;

△ Note Make sure to tighten according to contrary sequence of removal.

Tighten torque 3~5N m



2). Connect wiring harness connector of front combination light assembly;



2. Install front bumper assembly
3. Install upper cover plate of front bumper
4. Install front wheel cover
5. Install front guard cover of engine
6. Connect battery negative electrode
7. Close engine cabin cover

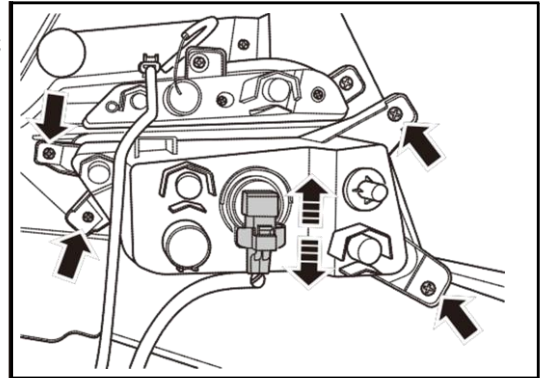
(III) Regulating

1. Regulate light of front combination light
 - 1). Ensure all wheel tire pressure is normal.
 - 2). Place vehicle and test device to the same plate ground.
 - 3). Ensure that vehicle is in unloaded state except driver (or place same weight in driver's seat).
 - 4). Open low beam light of front combination light.
 - 5). Regulate focusing light beam by using regulating bolt.
 - 6). There is a regulating point each in upper and lower regulating of low and high beam, which can regulate upper and lower height of high and low beam; there is a regulating point each in left and right regulating of low and high beam, which can regulate left and right height of high and low beam. If maintain front part of vehicle body and/or replace front combination light assembly, should check focusing light, and please regulate well by light test device.
 - 7). Focus light according to focusing light list until regulating well.

IV、Front Fog Light Assembly

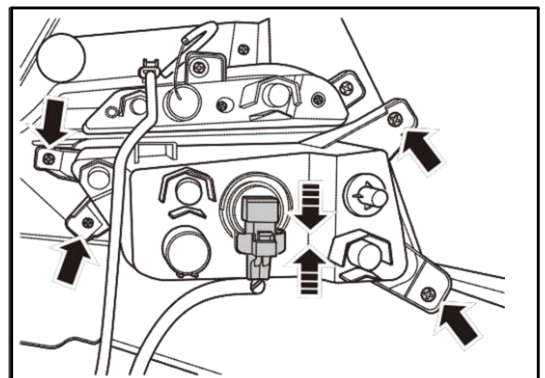
(I) Removal

1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove front wheel cover Refer to “Front wheel cover”
4. Remove front fog light assembly
 - 1). Disconnect wiring harness connector of front fog light assembly;
 - 2). Remove 4 fixed bolts of front fog light assembly and front bumper;
 - 3). Take down front fog light assembly;



(II) Installation

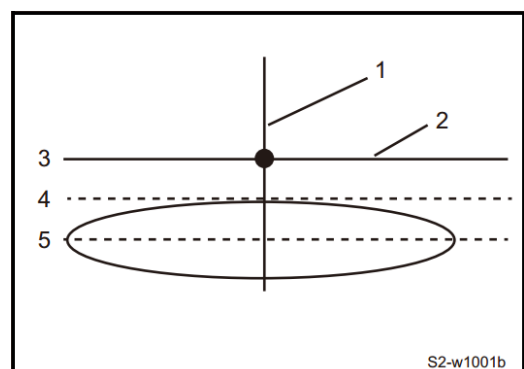
1. Install front fog light assembly
 - 1). Place front fog light assembly to installation position, and tighten 4 fixed bolts;
 - Tighten torque 1~3N m
 - 2). Connect wiring harness connector of front fog light assembly;



2. Install front wheel cover
3. Connect battery negative electrode
4. Close engine cabin cover

(III) Regulating

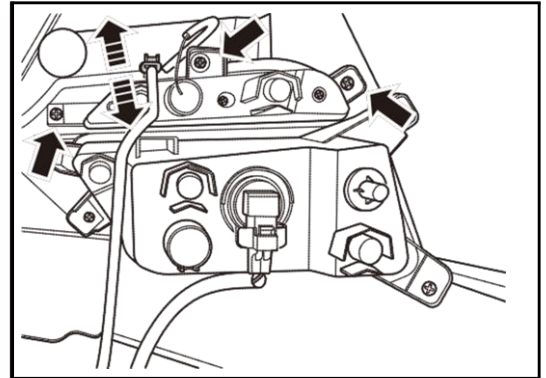
1. Regulate light beam of front fog light
 - △ Note Front fog light beam must be regulated, thus it can supply right illumination.
 - △ Note Installing new fog light assembly or maintain front part of vehicle may disturb installation bracket of front fog light, thus must check regulating of front fog light beam.
 - △ Note Front fog light beam in this vehicle type can't be regulated horizontally.
 - 1). To ensure accurate regulating of front fog light vertical beam, firstly prepare vehicle according to the steps below.
 - If vehicle has carried out other maintenance ever, firstly should ensure all components in vehicle are in place.
 - Ensure fuel is full or almost full.
 - Place vehicle in horizontal ground and is 1.52m far away from target screen.
 - Stop all other operations in vehicle.
 - Shake vehicle suspension in place.
 - Cover front combination light when regulating fog light beam.
 - 2). Open front fog light.
 - 3). Insert screwdriver by lower space of front bumper to get close to vertical regulating bolt of fog light.
 - 4). Regulate fog light up and down to let high lightness area on screen 102mm lower than horizontal central line (2). Range on target screen is ground boundary line (5) lower than horizontal central line 0mm (3).
 - 5). Close front fog light.



V、Daylight Driving Light Assembly

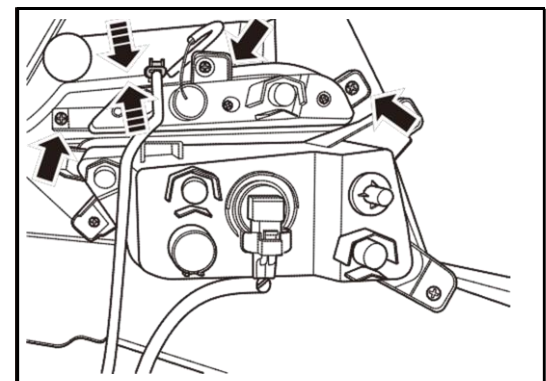
(I) Removal

1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove front wheel cover Refer to “Front wheel cover”
4. Remove daylight driving light assembly
 - 1). Disconnect wiring harness connector of daylight driving light assembly;
 - 2). Remove 3 fixed bolts of daylight driving light assembly and front bumper;
 - 3). Take down daylight driving light assembly



(II) Installation

1. Install daylight driving light assembly
 - 1). Place daylight driving light assembly to installation position, and tighten 3 fixed bolts;
Tighten torque 1~3N·m
 - 2). Connect wiring harness connector of daylight driving light assembly;

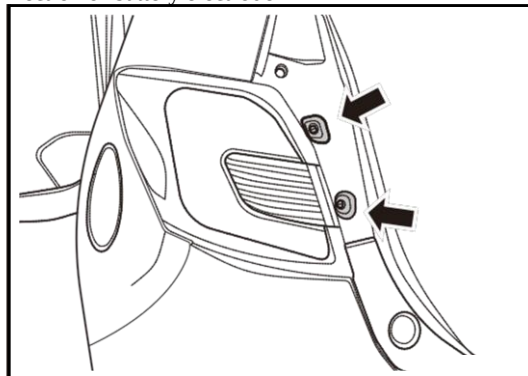


2. Install front wheel cover
3. Connect battery negative electrode
4. Close engine cabin cover

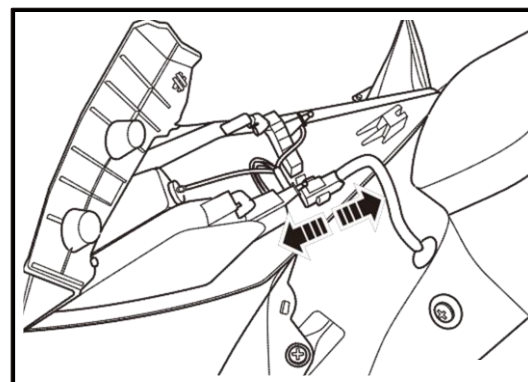
VI、Rear Side Wall Combination Light Assembly

(I) Removal

1. Open rear tail door
2. Open engine cabin cover
3. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
4. Remove rear side wall combination light assembly
 - 1). Remove 2 fixed bolts of rear side wall combination light assembly;

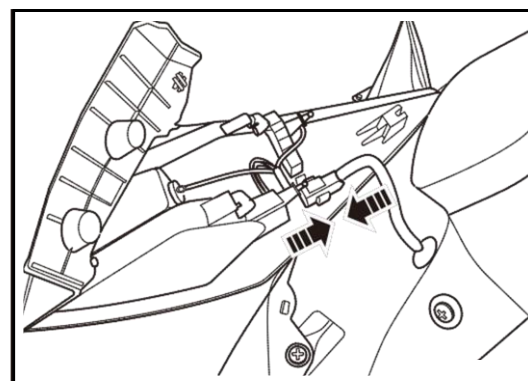


- 2). Remove rear side wall combination light assembly back, and disconnect wiring harness connector;
- 3). Take down rear side wall combination light assembly;



(II) Installation

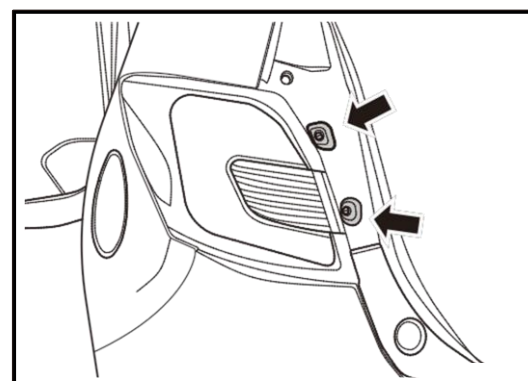
1. Install rear side wall combination light assembly
 - 1). Connect wiring harness connector of rear side wall combination light assembly, and install rear side wall combination light assembly;



- 2). Tight 2 fixed bolts of rear side wall combination light assembly;

△ Note Check whether rear side wall combination light assembly is good before installing, and don't damage rear side wall combination light assembly when installing, check whether rear side wall combination light assembly is installed well after installing, and whether fitting clearance with vehicle is suitable, if not, please re-install.

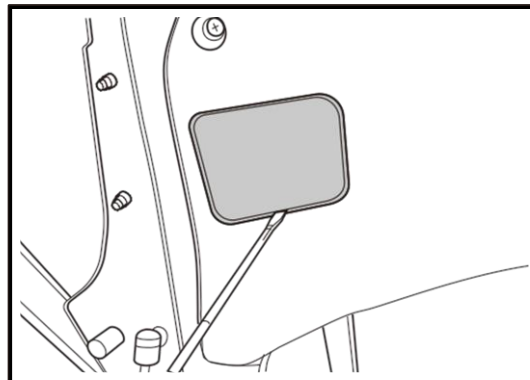
2. Close rear tail door
3. Connect battery negative electrode
4. Close engine cabin cover



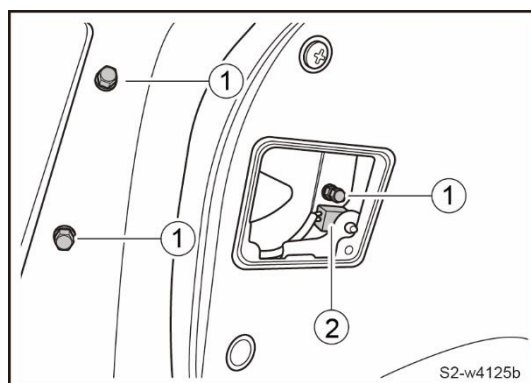
VII、Rear Tail Door Combination Light Assembly

(I) Removal

1. Open rear tail door
2. Open engine cabin cover
3. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
4. Remove rear tail door combination light assembly
 - 1). Pry tail light maintenance cover;

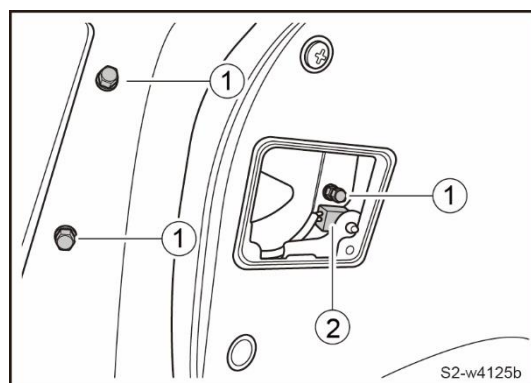


- 2). Remove 3 fixed nuts ① of rear tail door combination light assembly;
- 3). Disconnect wiring harness connector ② of rear tail door combination light assembly;
- 4). Take down rear tail door combination light assembly;



(II) Installation

1. Install rear tail door combination light assembly
 - 1). Place rear tail door combination light assembly to installation position, and tighten 3 fixed nuts ① of rear tail door combination light assembly;
 - 2). Connect wiring harness connector ② of rear tail door combination light assembly;



- 3). Install tail light maintenance cover;

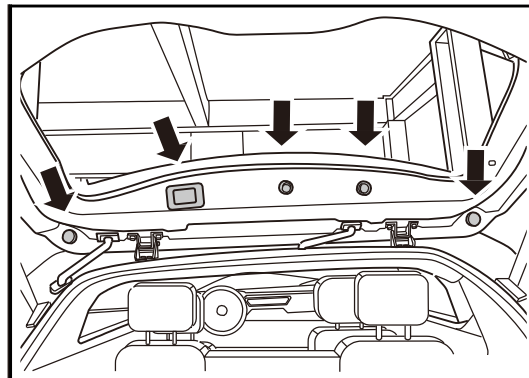
△ Note Check whether rear tail door combination light assembly is good before installing, and don't damage rear tail door combination light assembly when installing, check whether rear tail door combination light assembly is installed well after installing, and whether fitting clearance with vehicle is suitable, if not, please re-install.

2. Close rear tail door
3. Connect battery negative electrode
4. Close engine cabin cover

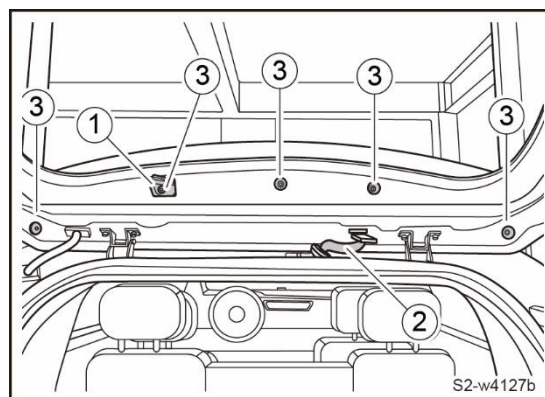
VIII、High Position Brake Light

(I) Removal

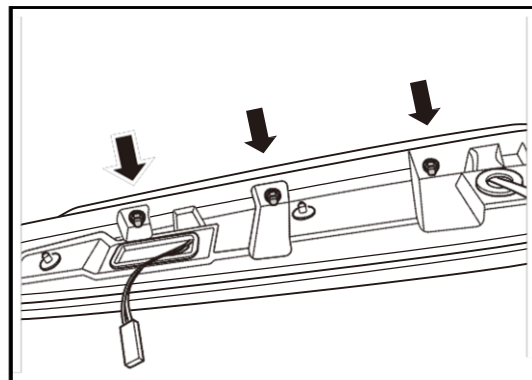
1. Open rear tail door
2. Open engine cabin cover
3. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
4. Remove empennage and brake light assembly
 - 1). Remove 5 rubber bonnet;



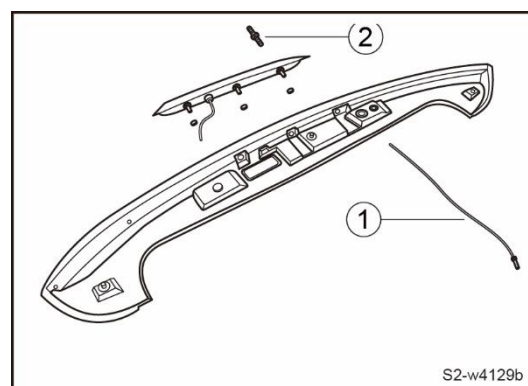
- 2). Pull out water pipe sheath ②, and disconnect connection of rear washing water pipe and vehicle body water pipe.
- 3). Remove 5 fixed nuts ③;
- 4). Disconnect high position brake light wiring harness ①;
- 5). Take down empennage and brake light assembly;



5. Remove high position brake light
 - 1). Remove 3 fixed nuts of high position brake light and light cover;



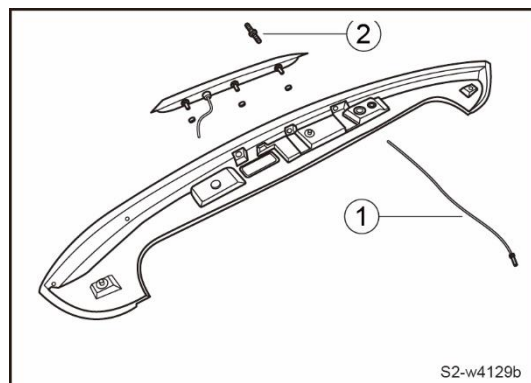
- 2). Disconnect connection of rear window spraying water pipe ① and rear window spraying nozzle ②;
- 3). Pull out rear window spraying nozzle ②;



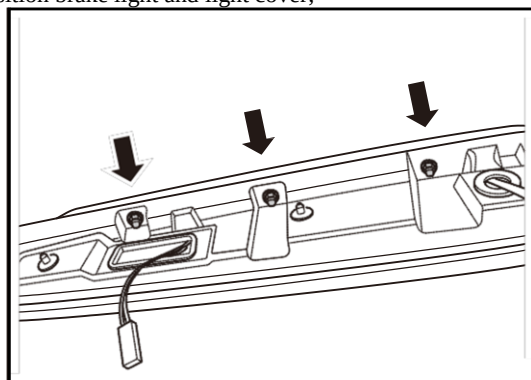
(II) Installation

1. Install high position brake light

- 1). Install rear window spraying nozzle ②, and connect rear window spraying water pipe ①;

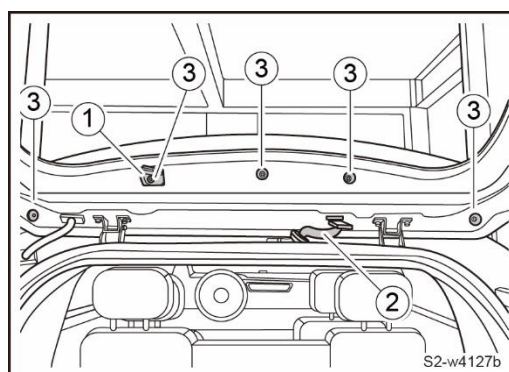


- 2). Install high position brake light, and tighten 3 fixed nuts of high position brake light and light cover;

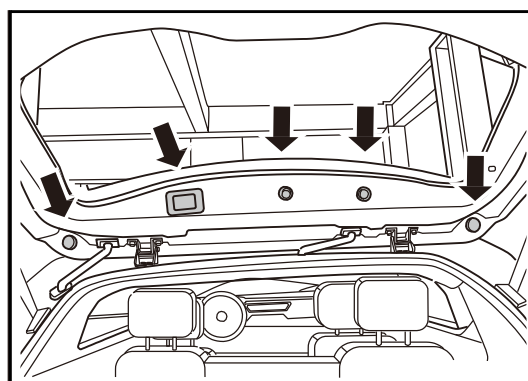


2. Install empennage and brake light assembly

- 1). Place empennage assembly to installation position, and connect wiring harness ① of high position brake light;
- 2). Tighten 5 fixed nuts ③;
- 3). Connect rear washing water pipe and vehicle body water pipe ②, and install water pipe sheath;



- 4). Install 5 bonnets;

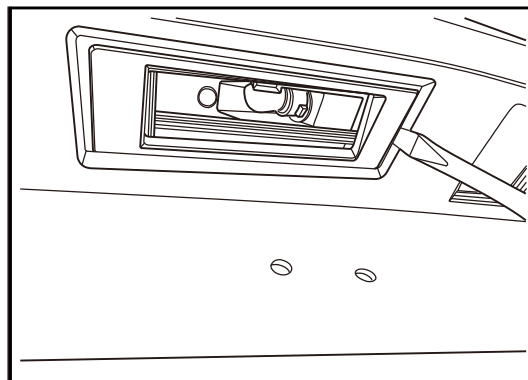


3. Close rear tail door
4. Connect battery negative electrode
5. Close engine cabin cover

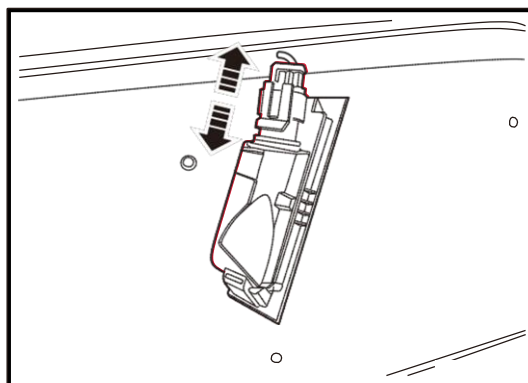
IX、License Plate Light Assembly

(I) Removal

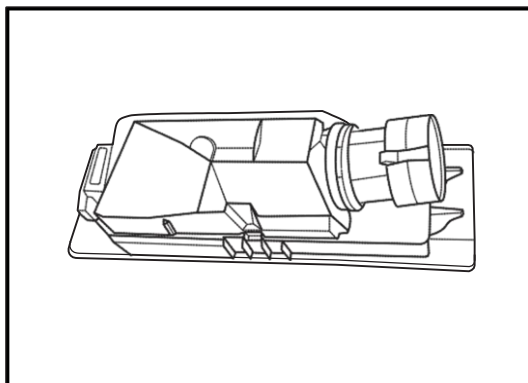
1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove license plate light assembly
 - 1). Pry license plate light assembly;



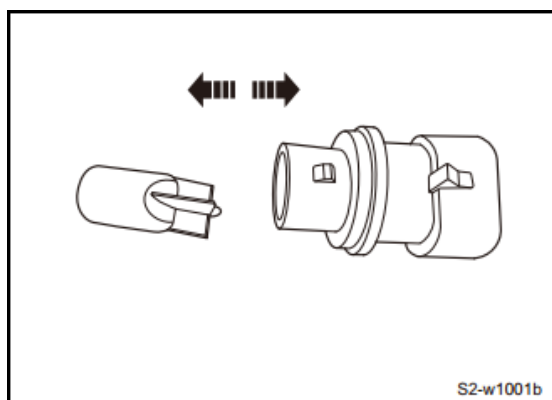
- 2). Disconnect wiring harness connector of license plate light assembly, and take down license plate light assembly;



- 3). Screw off light seat of license plate light;



- 4). Pull out light bulb of license plate light;



S2-w1001b

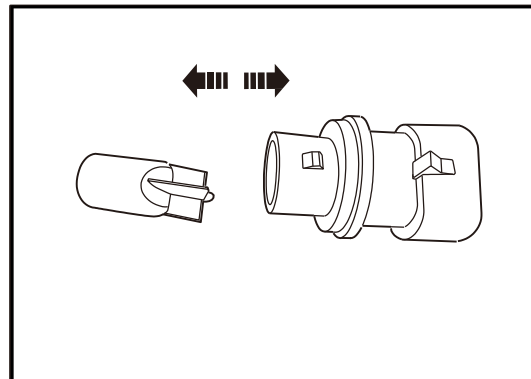
(II) Check

1. Check license plate light
 - 1). Check whether light bulb filament of license plate light is fused.

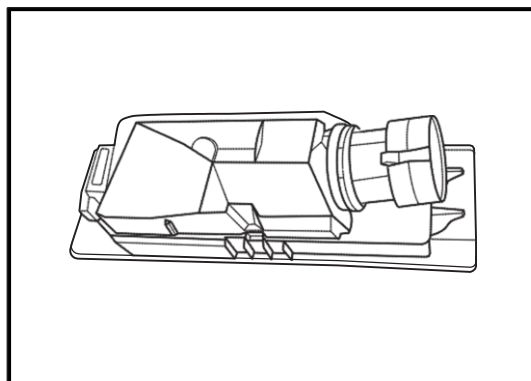
(III) Installation

Note

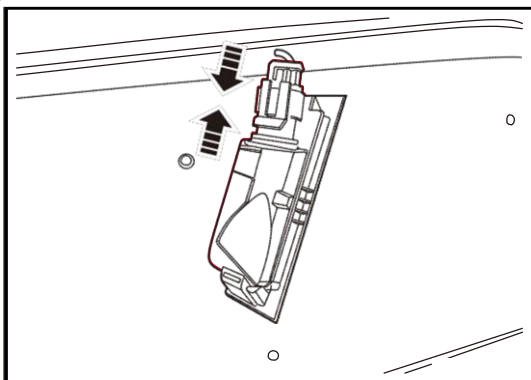
1. Install license plate light assembly
 - 1). Screw on light bulb of license plate light;



- 2). Install light seal of license plate light;



- 3). Connect wiring harness connector of license plate light assembly;



- 4). Press license plate light assembly into installation hole, and ensure to be installed in place;

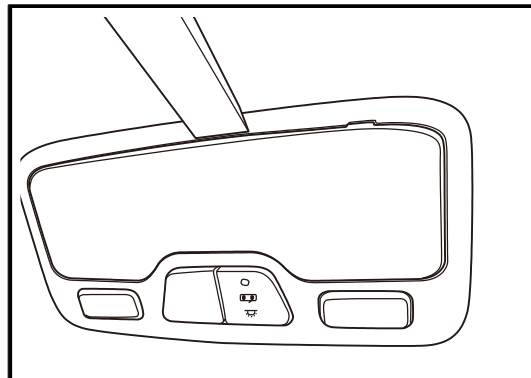
△ Note Check whether light bulb is good before installing, install light seal into installation hole, and install in place.

2. Connect battery negative electrode
3. Close engine cabin cover

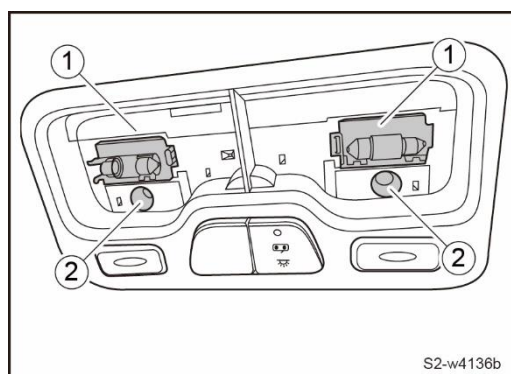
X、Front Top Light Assembly

(I) Removal

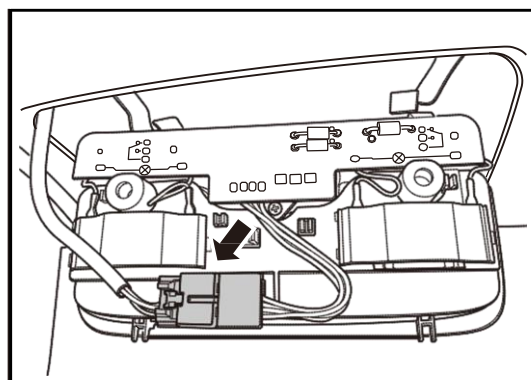
1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove front top light assembly
 - 1). Pry cover plate of front top light assembly;



- 2). Remove 2 light bulb ① of front top light;
- 3). Remove 2 fixed bolts ② of front top light assembly;



- 4). Disconnect wiring harness connector of front top light assembly, and take down front top light assembly;



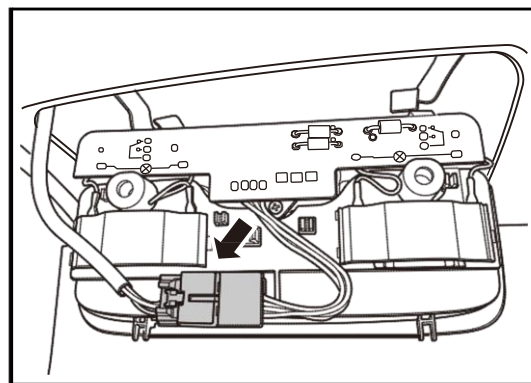
(II) Check

1. Check front top light
 - 1). Check whether light bulb filament of front top light is fused.

(III) Installation

1. Install front top light assembly

- 1). Connect wiring harness connector of front top light assembly;

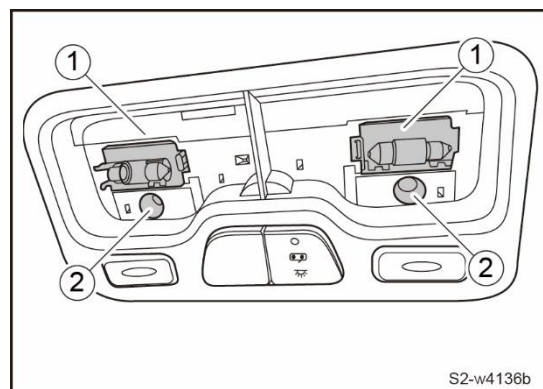


- 2). Turn light bulb ① of front top light into installation hole, and ensure to be installed in place;

- 3). Tighten 2 fixed bolts ② of front top light assembly;

- 4). Press in cover plate of front top light assembly and ensure to be installed in place;

△Note Firstly check whether light bulb is good before installing, and light bulb in installation substrate is installed in place. Check whether it is accord with requirement after installing.



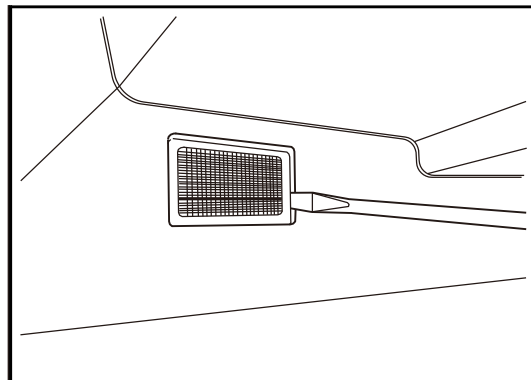
S2-w4136b

2. Connect battery negative electrode
3. Close engine cabin cover

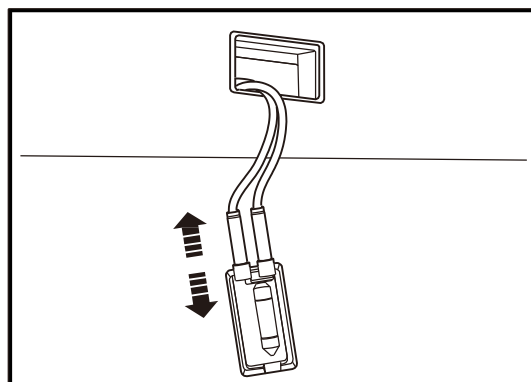
XI、Trunk Light

(I) Removal

1. Open rear tail door
2. Open engine cabin cover
3. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
4. Remove trunk light
 - 1). Pry trunk light;



- 2). Disconnect wiring harness connector of trunk light;
- 3). Remove light bulb of trunk light;

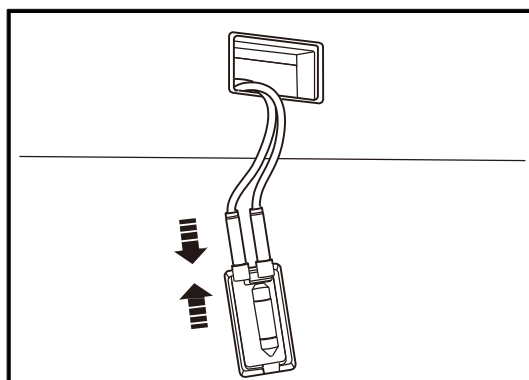


(II) Check

1. Check trunk light
 - 1). Check whether light bulb filament of trunk light is fused.

(III) Installation

1. Install trunk light
 - 1). Install light bulb of trunk light;
 - 2). Connect wiring harness connector of trunk light;
 - 3). Press trunk light into installation hole, and ensure to be installed in place;

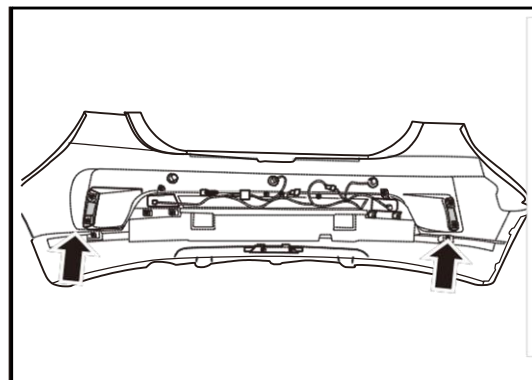


2. Close rear tail door
3. Connect battery negative electrode
4. Close engine cabin cover

XII、Rear Reflector Assembly

(I) Removal

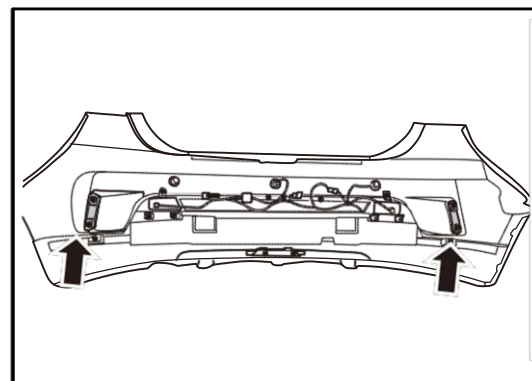
1. Open rear tail door
2. Open engine cabin cover
3. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
4. Remove rear side wall combination assembly Refer to “Rear side wall combination assembly”
5. Remove rear bumper assembly Refer to “rear bumper assembly”
6. Install rear reflector assembly
 - 1). Remove 2 fixed bolts of rear reflector assembly;
 - 2). Take down rear reflector assembly;



(II) Installation

1. Install rear reflector assembly
 - 1). Place rear reflector assembly in installation position, and tighten 2 fixed bolts;

△Note Check whether rear reflector assembly is good before installing. Don't damage rear reflector assembly when installing. Check whether rear reflector assembly is installed in place after installing, and whether fitting clearance of bumper is proper, if not, please re-install.

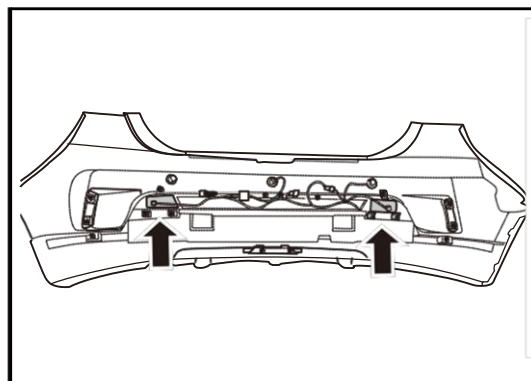


2. Install rear bumper assembly
3. Install rear side wall combination assembly
4. Close rear tail door
5. Connect battery negative electrode
6. Close engine cabin cover

XIII、Rear Reversing Light Assembly

(I) Removal

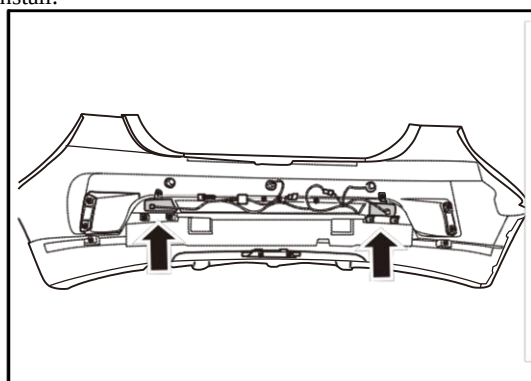
1. Open rear tail door
2. Open engine cabin cover
3. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
4. Remove rear side wall combination assembly Refer to “Rear side wall combination assembly”
5. Remove rear bumper assembly Refer to “rear bumper assembly”
6. Remove rear reversing light assembly
 - 1). Disconnect wiring harness connector of rear reversing light assembly;
 - 2). Remove 3 fixed bolts of rear reversing light assembly;
 - 3). Take down rear reversing light assembly;



(II) Installation

1. Install rear reversing light assembly
 - 1). Place rear reversing light assembly into installation place, and tighten 3 fixed bolts;
 - 2). Connect wiring harness connector of rear reversing light assembly;

△Note Check whether rear reversing light assembly is good before installing. Don't damage rear reversing light assembly when installing. Check whether rear reversing light assembly is installed in place after installing, and whether fitting clearance of bumper is proper, if not, please re-install.

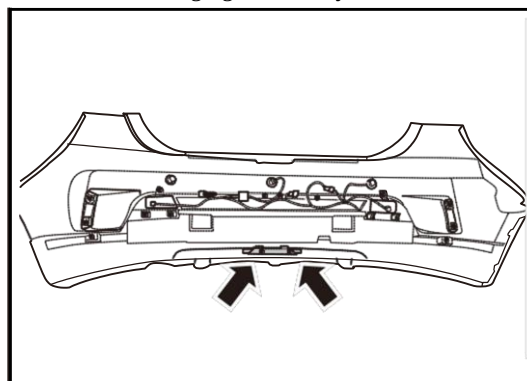


2. Install rear bumper assembly
3. Install rear side wall combination assembly
4. Close rear tail door
5. Connect battery negative electrode
6. Close engine cabin cover

XIV、Rear Fog Light Assembly

(I) Removal

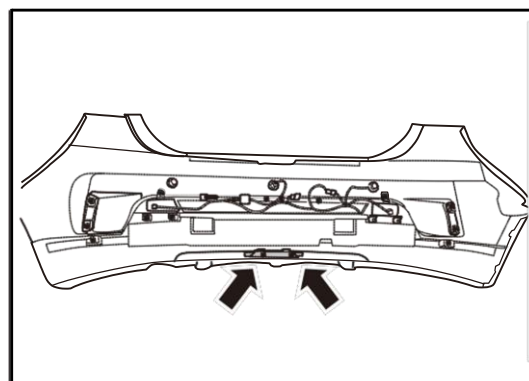
1. Open rear tail door
2. Open engine cabin cover
3. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
4. Remove rear side wall combination assembly Refer to “Rear side wall combination assembly”
5. Remove rear bumper assembly Refer to “rear bumper assembly”
6. Remove rear fog light assembly
 - 1). Disconnect wiring harness connector of rear fog light assembly;
 - 2). Remove 2 fixed bolts of rear fog light assembly;
 - 3). Remove connection of rear fog light assembly and rear bumper, and take down rear fog light assembly;



(II) Installation

1. Install rear fog light assembly
 - 1). Place rear fog light assembly into installation place, ensure it is connected to bumper in place, and tighten 2 fixed bolts;
 - 2). Connect wiring harness connector of rear fog light assembly;

△Note Check whether rear fog light assembly is good before installing. Don't damage rear fog light assembly when installing. Check whether rear fog light assembly is installed in place after installing, and whether fitting clearance of bumper is proper, if not, please re-install.



2. Install rear bumper assembly
3. Install rear side wall combination assembly
4. Close rear tail door
5. Connect battery negative electrode
6. Close engine cabin cover

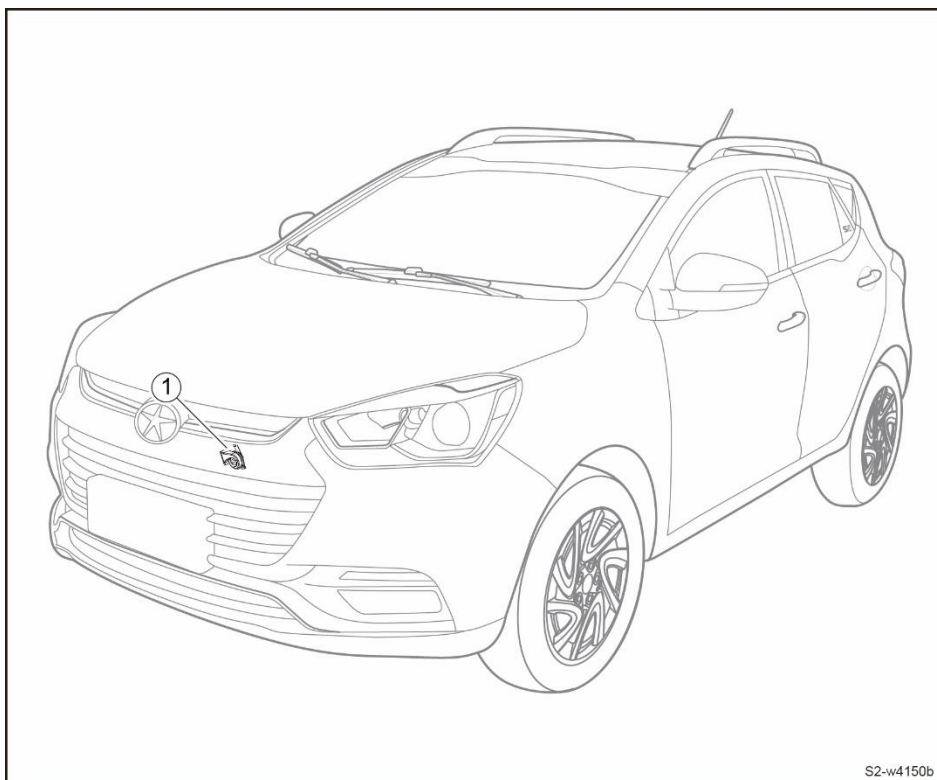
Electrical Horn

I、Summary

(I) Structure Overview

Horn is installed in front module assembly in front of vehicle, located in left side of front module, and equipped with a monophonic electrical horn.

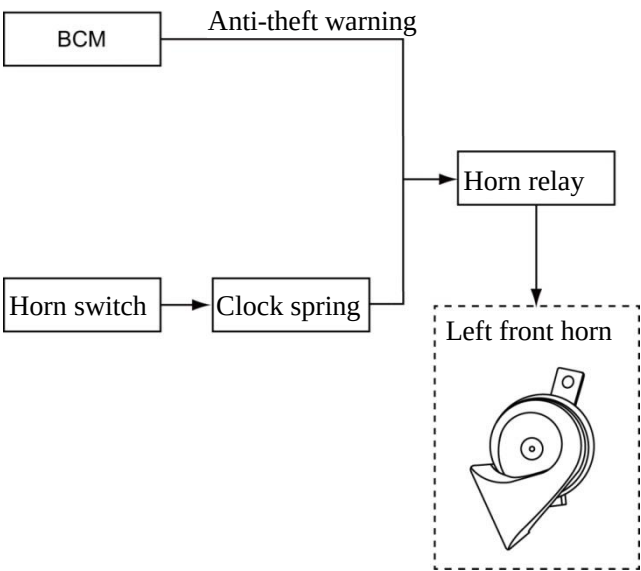
Component Position



1. Horn assembly

(II) Operation Principle

Control mode of horn is controlling power supply terminal, and control actuation of horn relay by horn switch or BCM, and then supply power to horn by relay, thus horn can work. Horn is always connecting to grounding.



II、Troubleshooting

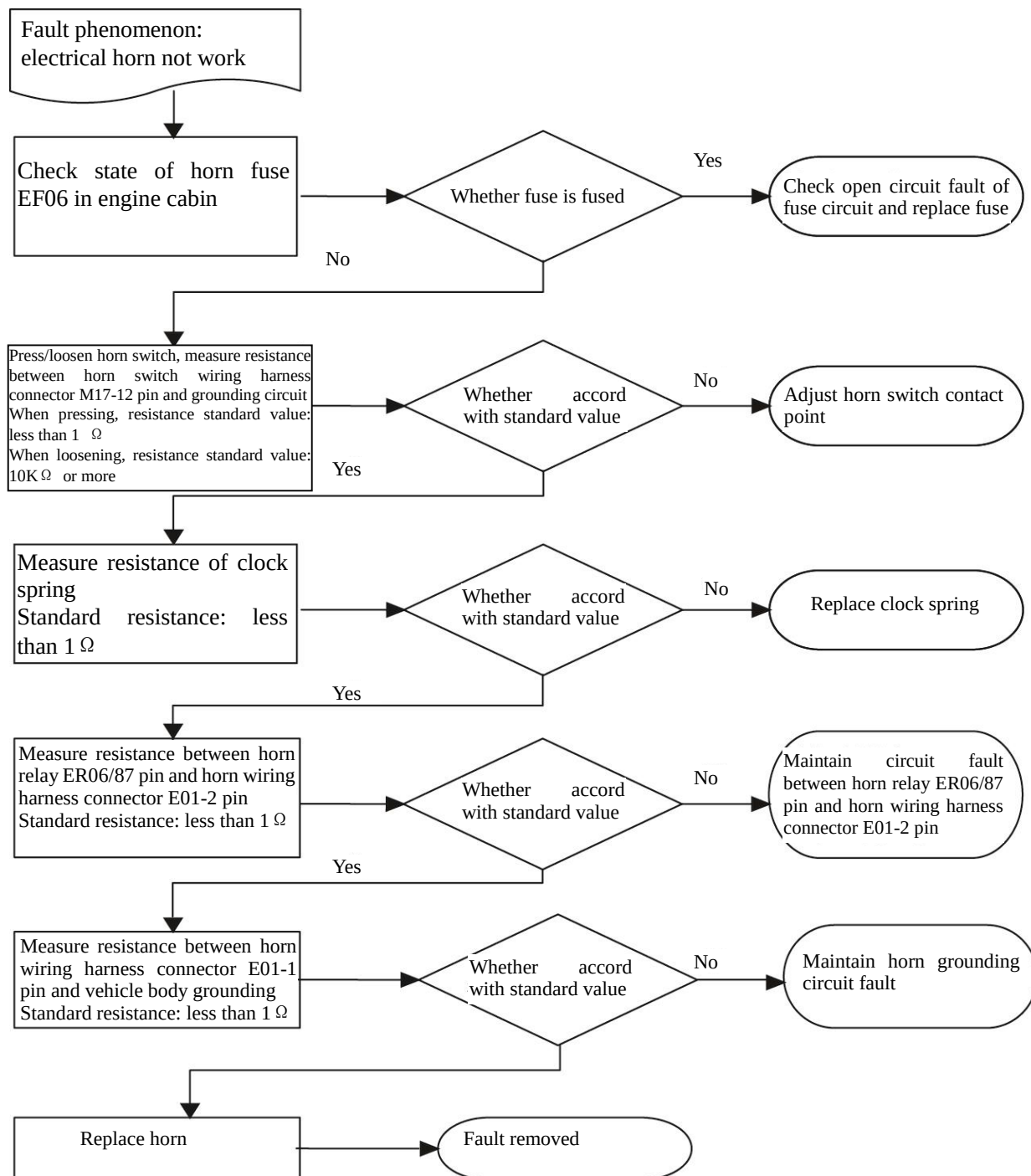
(I) Troubleshooting List

- 1. Detect after-sale installed device that may infect system operation.
- 2. Detect easily connected or found system component, to detect whether it has apparent damage or may cause fault.
- 3. If horn not work, should check and maintain power supply or bad contact or open circuit of switch grounding circuit before replacing horn.
- 4. When horn discontinuously works or pressing one side of steering wheel horn switch lose efficacy, it’s possible that horn switch bad contact, and should regulating horn switch contact in steering wheel at this time.

No.	Fault phenomenon	Fault reason analysis	Solution method	Remark
1	Horn not work	Horn relay fault	Replace horn relay	Refer to horn not work
		Power supply fuse fault	Replace fuse	
		Horn contact fault	Regulate horn contact	
		Clock spring fault	Replace clock spring	
		Horn power supply circuit fault	Check related circuit	
		Horn grounding circuit fault	Check related circuit	
		Horn fault	Replace horn	

(II) Troubleshooting Flow Chart

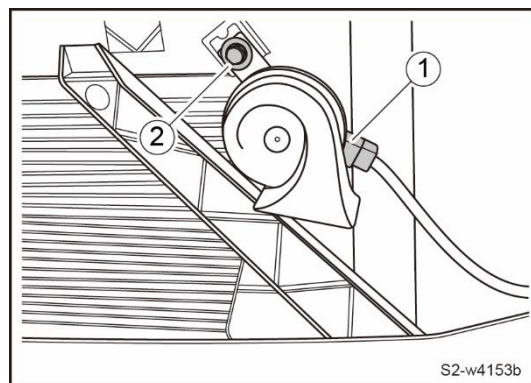
Horn not work



III、High Pitch Horn Assembly

(I) Removal

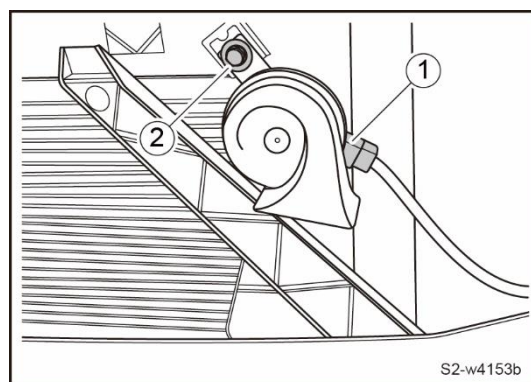
1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove front guard cover of engine Refer to “Front guard cover of engine”
4. Remove front wheel cover Refer to “Front wheel cover”
5. Remove upper cover plate of front bumper
6. Remove front bumper assembly
7. Remove high pitch horn assembly
 - 1). Disconnect wiring harness connector ① of high pitch horn assembly;
 - 2). Remove fixed bolt ② of high pitch horn



- assembly;
- 3). Take down high pitch horn assembly;

(II) Installation

1. Install high pitch horn assembly
 - 1). Place high pitch horn assembly to installation position, and tighten fixed bolt ② of high pitch horn assembly;
 - 2). Connect wiring harness connector ① of high pitch horn assembly;



2. Install front bumper assembly
3. Install upper cover plate of front bumper
4. Install front wheel cover
5. Install front guard cover of engine
6. Connect to battery negative electrode
7. Close engine cabin cover

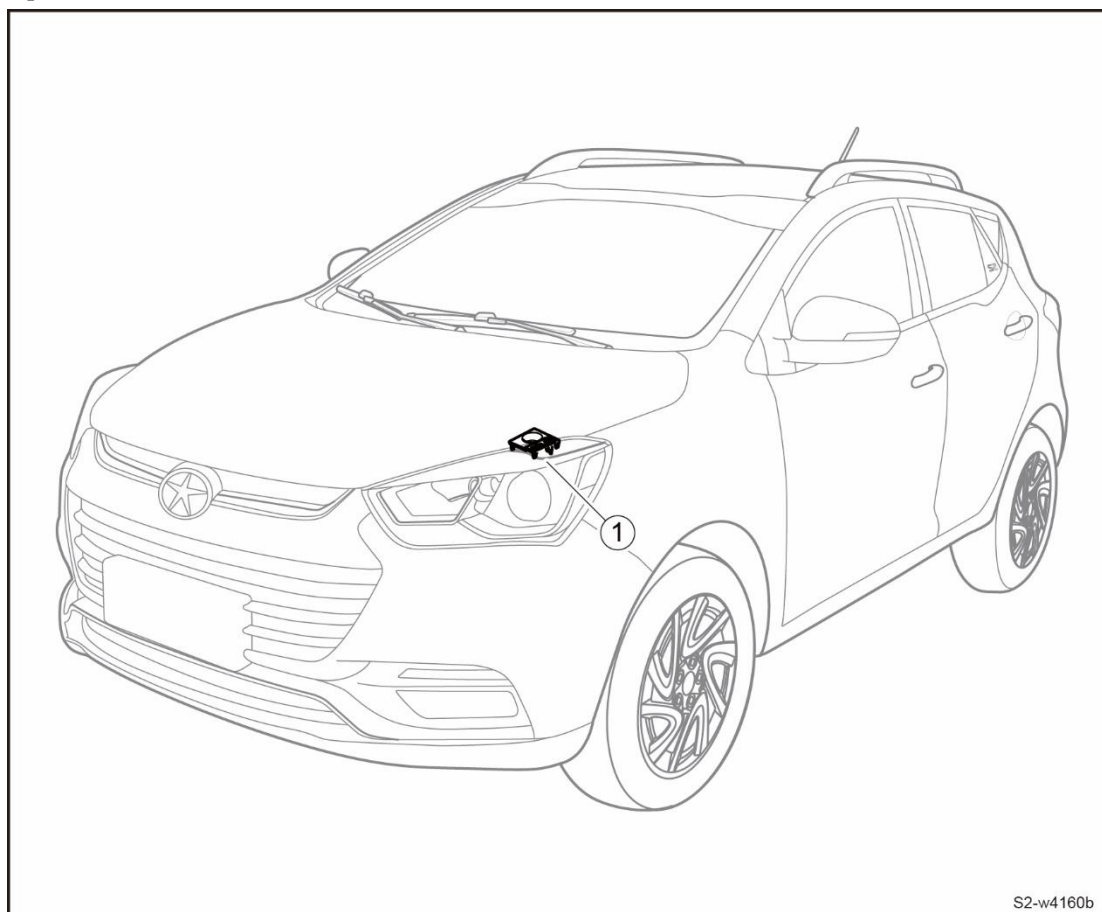
Power Supply on Vehicle

I、Summary

(I) Structure Overview

Power supply on vehicle is installed in front guard panel of auxiliary dashboard (lower part of central control dashboard), and supply power by ACC.

Component Position



1. Power supply on vehicle

△ Note Rated voltage of power supply on vehicle is 12V direct current, and can't use any electrical device that exceeds rated voltage and power.

II、Troubleshooting

(I) Troubleshooting List

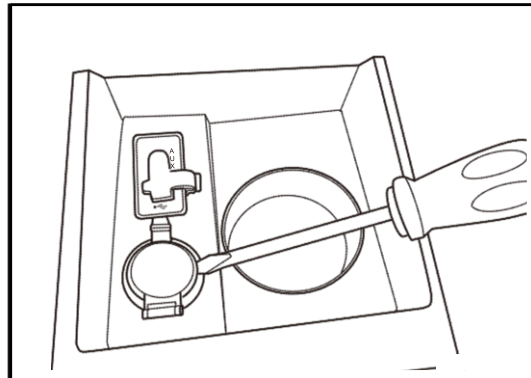
1. Detect after-sale installed device that may infect system operation.
2. Detect easily connected or found system component, to detect whether it has apparent damage or may cause fault.

NO.	Fault phenomenon	Fault reason analysis	Solution method	Remark
1	Power supply on vehicle not work	Power supply fuse fault	Replace fuse	
		Power supply and grounding circuit fault	Check charging system	
		Power supply on vehicle fault	Replace power supply on vehicle	

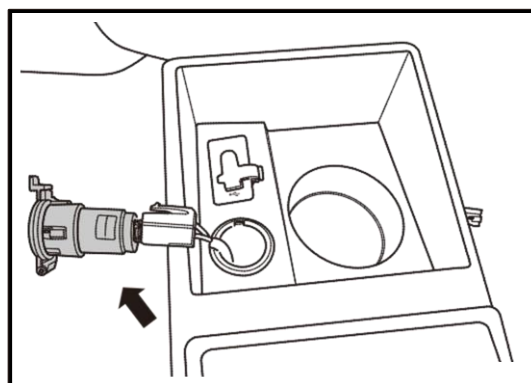
III、Power supply on vehicle

(I) Removal

1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove power supply on vehicle
 - 1). Pry power supply on vehicle;

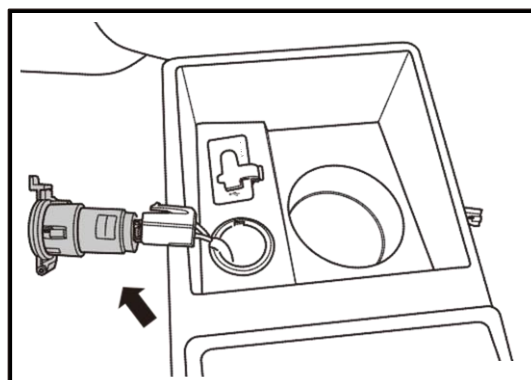


- 2). Disconnect wiring harness connector of power supply on vehicle;
- 3). Take down power supply on vehicle;



(II) Installation

1. Install power supply on vehicle
 - 1). Connect wiring harness connector of power supply on vehicle;
 - 2). Install power supply on vehicle to installation hole;
2. Connect battery negative electrode
3. Close engine cabin cover



Combination Meter

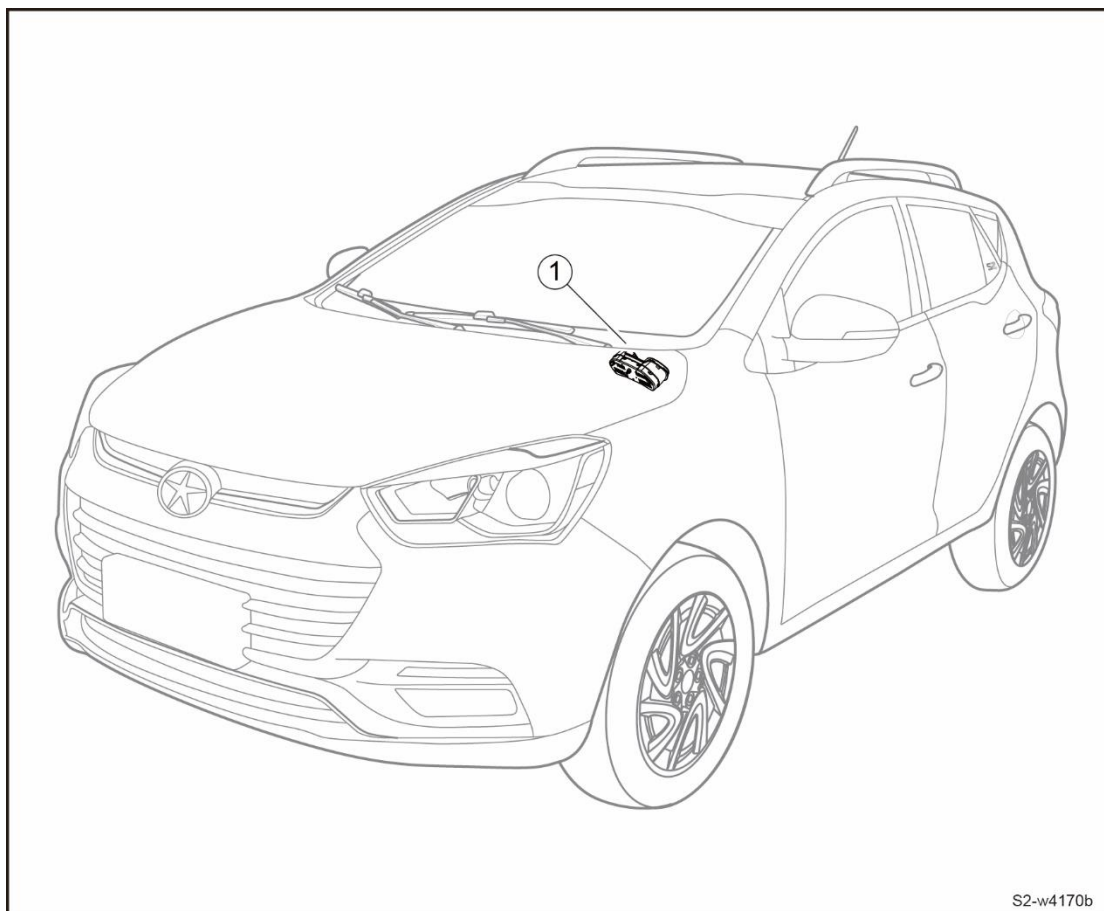
I、Summary

(I) Structure Overview

Combination meter is in dashboard of driver's right ahead and steering column upper opening. Other parts of combination meter, including installation parts and electrical connector is packaging inside dashboard behind combination meter frame. Except analog meter and indicator, various warning or indicating and some diagnosis information is installed.

The vehicle combination meter apply to four type, and using planar structure. Two large indicator header, left is tachometer, right is speedometer, fuel gauge and coolant temperature gauge is respectively in the right and left side of LCD display screen. LCD display screen is display content including: clock, total mileage, mileage subtotal, door open and gear position etc..

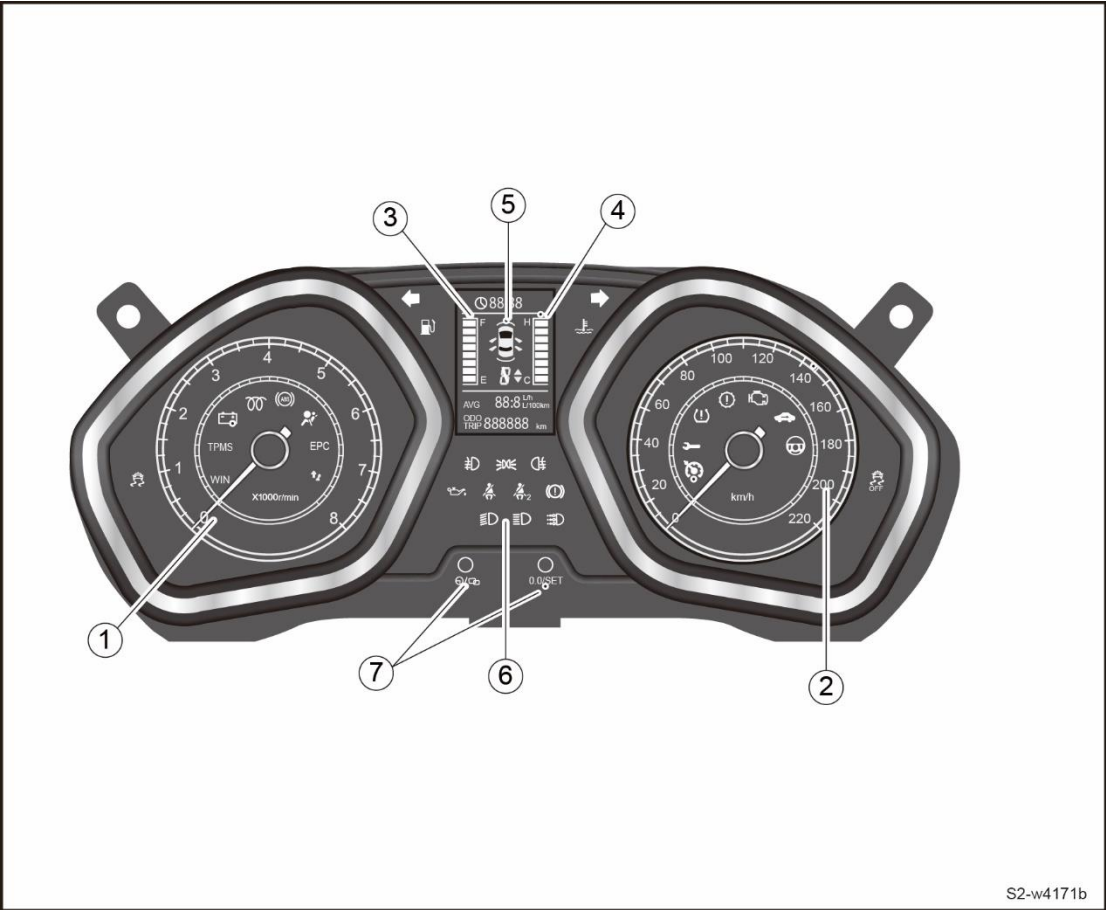
Component Position



S2-w4170b

1. Combination meter

Combination meter picture



1. Tachometer

2. Speedometer

3. Fuel gauge

7. Setting and regulating button
4. Coolant temperature gauge

5. Driver’s information display screen

6. Indicating light

(II) Operation Principle

Tachometer

Meter receives CAN message value EngSpd transmitted by ECU, and transforms into engine speed value that using rpm as a unit. Red zone range: 6200rpm ~ 8000rpm.

Engine speed and CAN signal compare list:

Engine speed （rpm）	CAN message value	Allowed error range （rpm）
1000	0x7D0	±60
2000	0xFA0	±100
3000	0x1770	±100
4000	0x1F40	±150
5000	0x2710	±150
6000	0x2EE0	±150
7000	0x36B0	±200
8000	0x3E80	±200

Speedometer

Meter receives CAN message value VehSpd speed signal value from ESP, and transforms into speed value that using km/h as a unit. $E=N*0.05625$

Vehicle speed and CAN signal compare list:

Actual vehicle speed (km/h)	CAN message value	Vehicle speed indicating range (km/h)
20	0x164	20~23
60	0x42A	60~65
100	0x6F2	100~105
160	0xB1C	160~168
220	0xF47	220~229

Fuel gauge

Resistance signal from fuel sensor directly connect to connector pin of combination meter.

Meter indicating and resistance value compare list:

LCD screen display	Resistance /Ω	Meter resistance /Ω
E	200 ±5	195
1grid (Warning point)	172 ±5	172
2 grid	142 ±5	142
3 grid	117 ±4	117
4grid	89 ±4	89
5grid	70 ±4	70
6grid	58 ±3	58
7grid	40 ±3	40
F	25 ±3	28

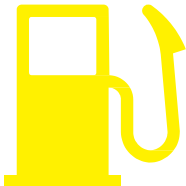
Coolant temperature gauge

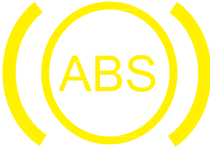
Coolant temperature gauge using block code indicating, signal source is CAN signal transferred by EMS, ID: 0x118; Period: 10ms; Name: EngCoolanTpt, When receiving signal EngCoolanTptVd is 1, according to starting byte: 56, data length 8 bits, deviation value -48, reach N, $E=N*0.75-48$

LCD screen display	Meter rising sample		Meter dropping sample	
	Rising (°C)	CAN value	dropping (°C)	CAN value
C(0 grid)	Common difference ±3		≤ 49	0x81
1 grid	≥ 50	0x82	≤ 59	0x8E
2 grid	≥ 60	0x90	≤ 69	0x9C
3grid	≥ 70	0x9D	≤ 79	0xA9
4 grid	≥ 80	0xAA	≤ 109	0xD1
5-7 grid	≥ 110	0xD2	≤ 119	0xDE
8grid	≥ 120	0xE0	Common difference ±3	

Combination meter function introduction

Warning symbol

No.	Name	Type	Symbol	Color	Control method	Connect to	Soft self-inspection	Remark
1	Fuel warning	LED		Yellow	Resistance signal	Ignition	√	Chip port triode amplifying
2	Coolant temperature warning	LED		Red	CAN signal	Ignition	√	
3	EOBD	LED		Yellow	CAN signal	Ignition		
4	Oil pressure	LED		Red	Direct (low voltage)	Ignition		
5	Parking brake	LED		Red	CAN signal	Ignition		
	Brake liquid fault				Direct (low voltage)	Ignition		
	EBD fault				CAN signal	Ignition	√	
6	Driver's air bag	LED		Red	Direct (low voltage)	Ignition	√	

No.	Name	Type	Symbol	Color	Control method	Connect to	Soft self-inspection	Remark
7	Engine fault	LED		Yellow	CAN signal	Ignition		
8	ABS	LED		Yellow	CAN signal	Ignition		
9	Battery charging	LED		Red	Direct (low voltage)	Ignition		Output port connect to diode to protect
10	Right turning	LED		True green	CAN signal	Meter grounding		
11	Left turning	LED		True green	CAN signal	Meter grounding		
12	Front fog light	LED		Green	CAN signal	Meter grounding		
13	Rear fog light	LED		Yellow	CAN signal	Meter grounding		
14	Engine anti-theft	LED		Yellow	Direct (Low voltage)	Battery		Also can work after closing ignition switch
15	Front headlight high beam	LED		Blue	CAN signal	Meter grounding		
16	Front headlight low beam	LED		Green	CAN signal	Meter grounding		

No.	Name	Type	Symbol	Color	Control method	Connect to	Soft self-inspection	Remark
17	Safety belt	LED		Red	Direct (Low voltage)	Ignition		
18	Pre-cruise	LED		White	CAN signal	Ignition		
19	Cruise	LED		Green	CAN signal	Ignition		
20	Front passenger's safety belt	LED		Red	Seat sensor: Load < 150Ω, unload > 8kΩ ; low voltage	Ignition		If equipped with front passenger's safety belt warning
21	Tire pressure warning	LED		Yellow	CAN signal	Ignition		If equipped with tire pressure monitoring
22	TPMS failure	LED		Yellow	CAN signal	Ignition		
23	EPS	LED		Red	CAN signal	Ignition		
24	Deflection angle signal not calibrated	LED		Yellow	CAN signal	Ignition		
25	Position light	LED		Green	CAN signal	Ignition		

Operation Instruction:
Speedometer and Subtotal mileage

Speedometer displays vehicle speed by km/h. Odometer displays driven mileage number of vehicle.

Total mileage

Total mileage gauge can display driven mileage number of vehicle so far.

Tachometer

Tachometer displays engine speed, unit is r/min.

Safety belt prompting light

Always twinkle until driver fastening safety belt. If driver has already fastened safety belt, the light will not be on.

Safety belt prompting sound

Not fasten safety belt and vehicle speed is more than 20km/h, it will send out warning sound of 1Hz frequency to prompt driver to fasten safety belt.

Air bag ready indicating light

There is air bag indicating light in dashboard, the light display air bag symbol. System will check whether there is fault in air bag system. And can learn whether there is electrical fault in air bag system through this light. System inspection includes air bag sensor, air bag module, circuit and diagnosis module. When vehicle starting, the light is on for several seconds, and then off, which indicating air bag system is ready. After starting vehicle, if air bag ready indicating light is always on or on when driving, it indicating air bag system is abnormal.

Charging system indicating light

As a check item, when ignition switch is connected and engine is not starting, charging system indicating light will be on for a short time, which indicating its function is normal. After engine starting, the indicating light will be off. If indicating light is not off or on when driving, it indicates that there is electrical fault in charging system. If driving vehicle when the light is on, it will exhaust battery power. If have to drive for a short distance when the light is on, must close all accessory, such as radio and A/C.

ABS indicating light

When turning ignition switch to on, the warning light will be continuously on for several seconds, which is normal phenomenon. If warning light is always not off, turn ignition switch to LOCK. If warning light is on, stop vehicle as soon as possible and close ignition switch, and then restart engine to reset system. If warning light is still not off or on when driving, maintain vehicle. If convention braking system warning light is not on, vehicle can brake, but can't use ABS. If convention braking system warning light is on, there is no ABS, and there is fault in convention braking system. When turning ignition switch to on, ABS warning light will be on for a short time, which is normal phenomenon. If warning light is not on at this time, should remove fault to let it send warning when fault appearing.

Engine coolant temperature gauge

When turning ignition switch to on, coolant temperature gauge displays engine coolant temperature.

Oil pressure warning light

If engine oil pressure is too low, the warning light will be always on after engine starting or on when driving, which indicating engine oil is not enough. Engine oil level may be too low, and maybe there is other oil fault. Oil warning light may be on in the other three conditions:

1、As a check item, when turning ignition switch to on and engine not starting, the warning light will be on, which indicating its function is normal. After engine starting, the warning light will be off. If turning ignition switch to on and the light is not on, there is fault in fuse or light bulb.

2、If engine idling running when at red light, warning light may twinkle and then be off. If emergency brake, the light will be on for a short time, which is normal phenomenon.

△ Note Don't continue to drive when oil pressure is too low.

△ Note If engine oil lack of proper maintenance, it may damage engine.

High beam indicating light

Every time high beam light is on, the indicating light will be on.

Vehicle door not close indicating light

When vehicle door is not closed, screen door open indicating light will be always on until all vehicle doors are closed and totally locked.

Fuel gauge

When turn ignition switch to on, fuel gauge displays remainder fuel in fuel tank. When fuel tank is almost empty, fuel level is too low and warning light will be on. There is still little fuel at this time, but should fill fuel as soon as possible.

EPS fault indicating light

When turning ignition switch to ON, the indicating light will be on, and there is no steering wheel assisted power in steering wheel, steering is heavy, and indicating light will be off after starting engine. If indicating light is on when driving, please stop vehicle and check immediately.

Sound Warning

Combination meter drives buzzer by interior amplifying circuit and sound wave generator of micro-processor to produce necessary sound warning. Reversing radar warning, driver's safety belt warning, front passenger's safety belt warning, parking brake warning, headlight not close warning are sound warning, warning priority is the sequence above-mentioned, sound loudness: 55±5db.

1. Reversing radar warning

1). Signal input

Voltage signal, come from reversing radar sensor.

2). Signal management

Obstacle distance (mm)	Sound frequency (Hz)	Zone	Note
> 1500	-	Safety zone	Reversing normally
900~1500	2	Safety zone	Reversing normally
600~900	4	Warning zone	Reversing decelerate
350~600	8	Danger zone	Stop reversing
< 350	Ding for a long time	Danger zone	Stop reversing

3). Signal output

Sound signal continuously send out until input signal disappear, sound frequency: 2000±10Hz.

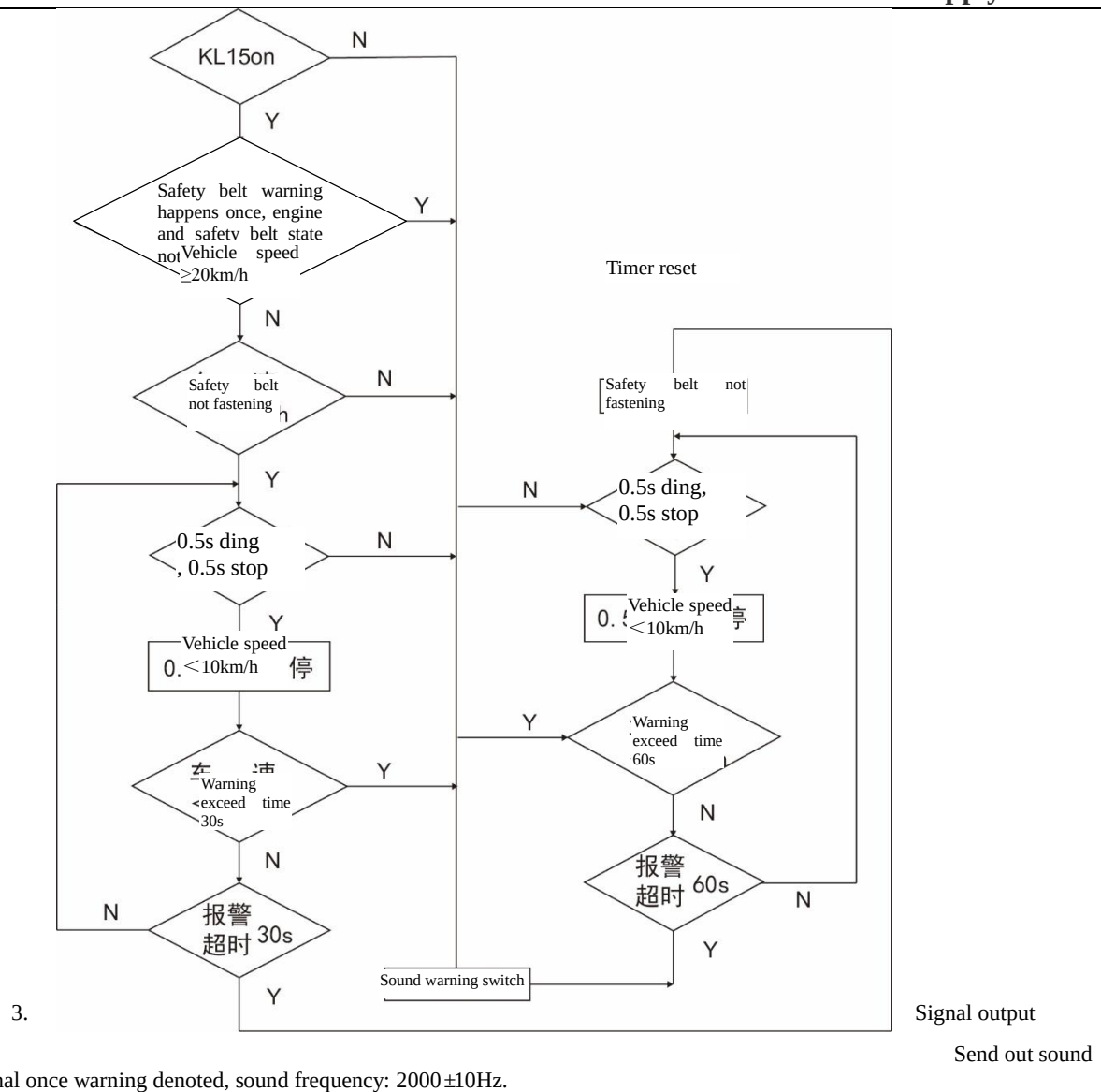
2. Safety belt not fastening warning

1). Signal input

Signal source: Drive safety belt indicating light, front passenger's safety belt indicating light, front passenger's seat sensor, vehicle speed signal.

2). Signal management

Refer to warning control logic in below figure, front passenger's safety belt warning add the judgment of whether there is person in front passenger's seat.



signal once warning denoted, sound frequency: $2000 \pm 10\text{Hz}$.

3. Parking brake warning

1. Signal input

Depend on the signal state below: parking brake, vehicle speed.

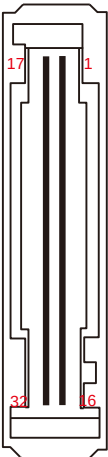
2. Signal management

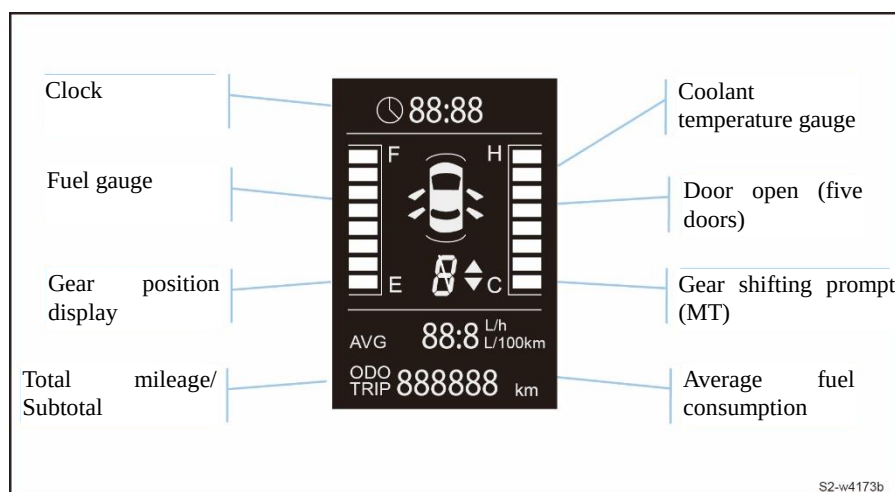
Parking brake signal and vehicle speed $\geq 5\text{km/h}$.

3. Signal output

Send out sound signal once warning denoted, sound frequency: $2000 \pm 10\text{Hz}$, and ding for a long time.

Combination meter connector and pin definition

Component side connector shape and pin definition (shape)	Connector definition (component side)						
	No.	Signal	Driving mode	No.	Signal	Driving	Remark
	1	Vehicle speed signal output		17	Communication		
	2	Front passenger's seat sensor	Resistance	18	Battery		
	3	Driver's safety belt switch	Low voltage	19	Ignition (IGN)		
	4	Front passenger's safety belt switch	Low voltage	20	-		
	5	PCAN_H		21	-		
	6	PCAN_L		22	Reversing radar	PWM	
	7	Engine anti-theft	Low voltage	23	Meter -		
	8	BCANH		24	Fuel sensor -		
	9	BCANL		25	Fuel signal	Low voltage	
	10	-		26	Inner illumination(-)	PWM	
	11	-		27	Inner illumination(+)	High voltage	
	12	Brake liquid level low	Low voltage	28	-		
	13	-		29	Charging indicating	Low voltage	
	14	Main air bag	High voltage or hanged	30	Oil pressure	Low voltage	
	15	-		31	-		
	16	-		32	-		

Driver's information display
LCD display


(1) Door open: Combination meter receives door open signal (including left front door, right front door, left rear door, right rear door and trunk) from door contact switch, and correspondingly displayed on LCD.

(2) Gear position information: Display gear position of the vehicle and more economic and reasonable gear position prompt when vehicle driving (The function only in MT vehicle type).

(3) LCD first line display actual time clock.

(4) LCD second line display average fuel consumption. Average consumption: when ignition switch is in ignition on (engine not start), LCD screen display fuel consumption record of last time; after engine starting, when ECU has not fuel consumption signal, LCD screen display average consumption record of last time; if there is fuel consumption signal, display average fuel consumption value; LCD screen freshening time is 5s.

(5) LCD third line display subtotal mileage or total mileage. Subtotal mileage display range is: 0km?~999.9km, precision is 0.1km; total mileage display range is: 0?~999999km, precision is 1km.

(6) Key operation: user interface function switch and reset:

LCD screen default interface first line is clock display, second line display average consumption, third line display total mileage.

When pressing left regulating rod for a short time ($t \leq 2s$) in default interface, second line display average fuel consumption (average fuel consumption twinkles at this time), and pressing right regulating rod for a long time ($t > 2s$) to reset, not twinkle after resetting, and automatically exit if there is no operation in 5s;

When pressing left regulating rod again, third line display subtotal mileage (subtotal mileage twinkles at this time), and pressing right regulating rod for a long time to reset, not twinkle after resetting, and automatically exit if there is no operation in 5s;

When pressing left regulating rod again, third line display total mileage (total mileage twinkles at this time), and automatically exit if there is no operation in 5s;

Clock regulating:

In default interface, press left regulating rod for a long time ($t > 2s$) to get into clock regulating, “horn” twinkles at this time.

In “hour” regulating phase: press right regulating rod for a short time to increase “hour” a step, and and automatically exit regulating mode if there is no operation in 5s;

In “hour” regulating phase, press left regulating rod for a short time ($t \leq 2s$), getting into “minute” twinkling regulating phase at this time: press right regulating rod for a short time to increase “minute” a step, and press right regulating rod for a long time to increase “minute” in the speed of 5 steps/s; and automatically exit regulating mode if there is no operation in 5s in “minute” mode.

All twinkle frequency is 1Hz.

(III) Torque Parameter

No.	Item	Torque (N m)
1	Combination meter assembly fixed bolt	3~5

II、Troubleshooting

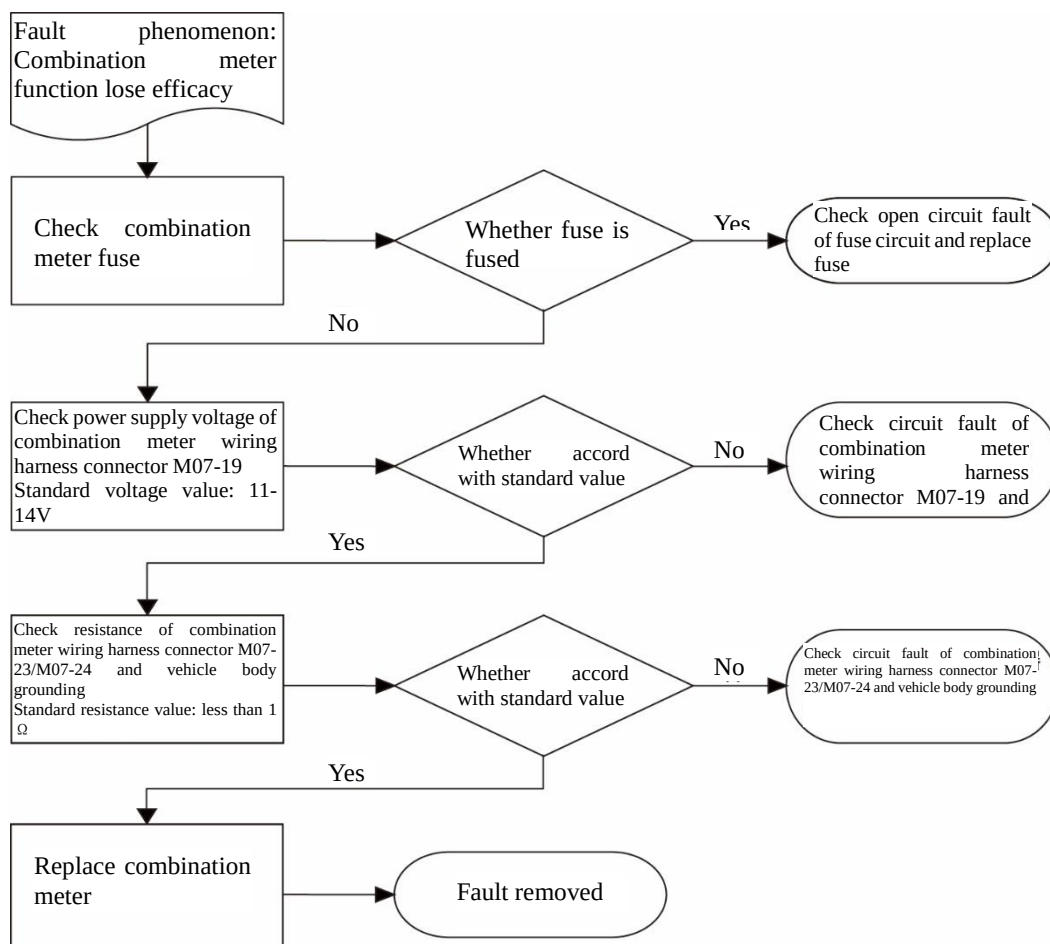
(I) Troubleshooting List

1. Detect after-sale installed device that may infect system operation.
2. Detect easily connected or found system component, to detect whether it has apparent damage or may cause fault.
3. Detect whether all sensors of combination meter displaying information are normal.

No.	Fault phenomenon	Fault reason analysis	Solution method	Remark
1	Combination meter function lose efficacy	Circuit not connected	Check power supply and grounding circuit	<u>Refer to combination meter function lose efficacy</u>
		Meter circuit damaged	Replace meter	
2	Indicating light/illumination light not on	Circuit not connected	Check whether related circuit and connector is connected	
		Control signal fault	Check related switch signal	
		Meter circuit damaged	Replace meter	
3	Indicating meter error or not work, mileage LCD not work	System fault	Check whether related sensor output is normal, whether circuit and connector is connected	
		Meter circuit damaged	Replace meter	
4	Mileage LDC miss stroke	Meter circuit damaged	Replace meter	

(II) Troubleshooting Flow Chart

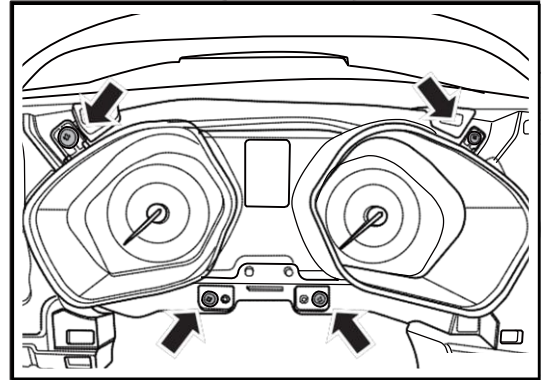
Combination meter function lose efficacy



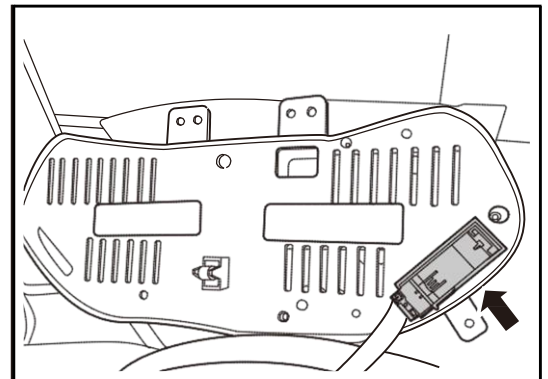
III、Combination Meter Assembly

(I) Removal

1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove central right side trim panel assembly Refer to “Central right side trim panel assembly”
4. Remove left end cover of dashboard Refer to “End cover of dashboard”
5. Remove driver’s side lower guard panel assembly Refer to “Driver’s side lower guard panel assembly”
6. Remove central left trim panel assembly Refer to “Central left trim panel assembly”
7. Remove combination meter assembly
 - 1). Remove 4 fixed bolts of combination meter;

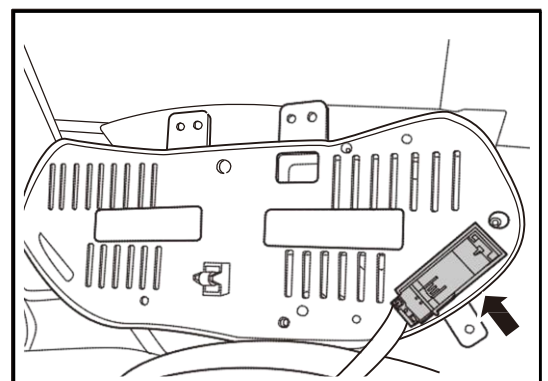


- 2). Pull out combination meter assembly, and disconnect wiring harness connector of combination meter;
- 3). Take down combination meter;



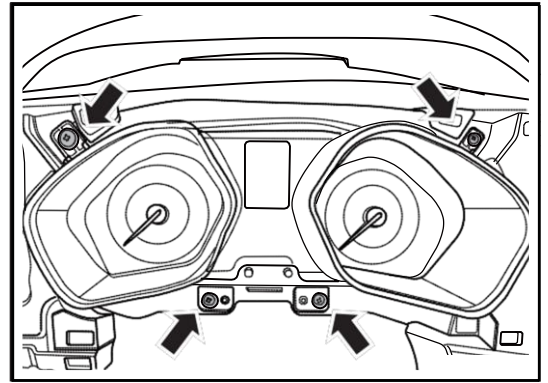
(II) Installation

1. Install combination meter assembly
 - 1). Connect wiring harness connector of combination meter, and place combination meter to installation position;



- 2). Tighten 4 fixed bolts of combination meter;
Tighten torque 3~5N·m

2. Install central left side trim panel assembly
3. Install driver's side lower guard panel assembly
4. Install left end cover of dashboard
5. Install central right side trim panel assembly
6. Connect battery negative electrode
7. Close engine cabin cover



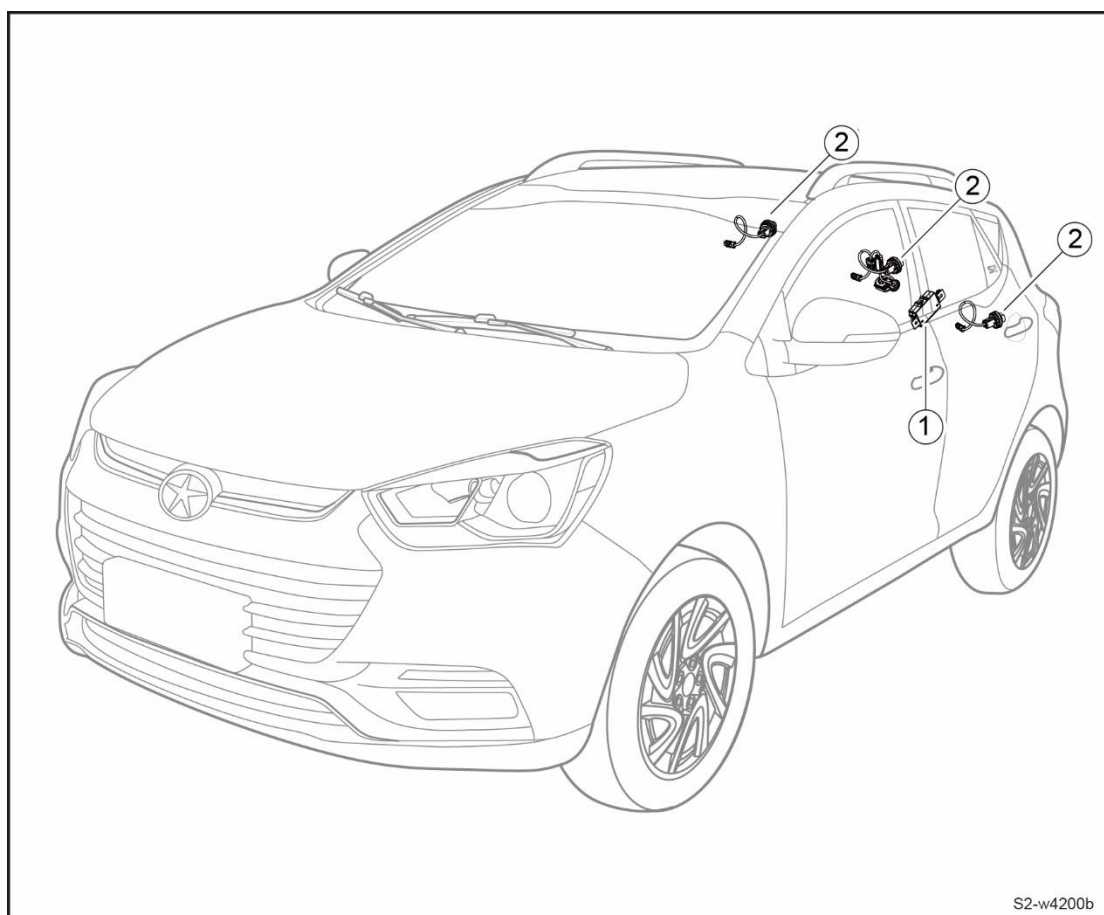
Reversing Radar Device

I、Summary

(I) Structure Overview

Reversing radar device consists of sensors, controller and buzzer (integrated in meter). Reversing radar device is based on the principle of ultrasonic distance measurement and computer data fuzzy processing technology to determine whether there are obstacles in the vehicle reversing direction and prompt the distance of the nearest obstacle. When the steering gear hanging in reversing, reversing switch on, reversing light on, controller receive reversing signal, control ultrasonic sensor send out ultrasonic signal, based on the principle of self-sending self-receiving and multiple sending single receiving, send echo signal to controller accurately and completely. After controller analyzing and processing, judge whether there are obstacles within detection distance and the distance of nearest obstacle, and establish communication with buzzer. According to the different range of distance, send different frequency tweet to prompt obstacle distance, aiming to security warming.

Component Position

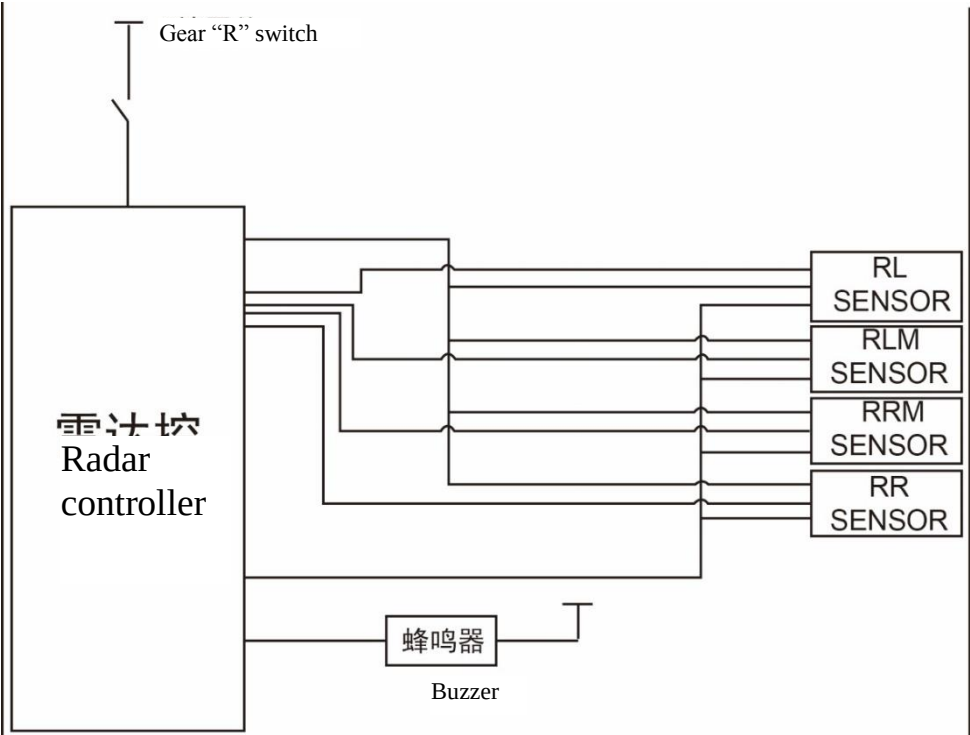


1. Reversing radar controller assembly

2. Sensor assembly

(II) Operation principle

System Schematic Diagram



II、Troubleshooting

(I) Troubleshooting List

NO.	Fault phenomenon	Fault reason analysis	Solution	Remark
1	When reversing, system not work	Reversing switch not connected	Replace reversing switch	Refer to system not work
		Wiring harness and main power supply bad connected	Check whether wiring harness connect to power supply rightly	
		Connector wrong connect	Connect all connectors rightly again	
2	Sensor not work	Connector position not right, causing sensor not work	Connect all sensor connectors rightly again	Refer to sensor not work
3	Buzzer continuously warning, but no obstacle behind vehicle	Detect body or ground	Install according to instructions, if necessary, request professional technician to guide and check	
		Sensor wrong installation or drop		
		Sensor damaged	Please replace in time	
		Sensor connected wire damaged	Check whether wiring harness is damaged	
4	Can't display the distance of obstacle rightly	Battery voltage abnormal	Check whether battery voltage is normal	
		Connector position not right	Close system, connect all connectors rightly again	
		Sensor wiring harness interfered	Check whether sensor connected wire connect exhaust pipe and muffler	
5	No warning tone when opening, others work normally and no warning tone	Combination meter fault (Buzzer is integrated in combination meter)	Check combination meter connected wire and connector, connect combination meter again rightly	
			Replace combination meter	

(II) Troubleshooting Flow Chart

System not work

Step	Detect content	Solution	Judging specification	Next step	
				Yes	No
1	Ensure fault phenomenon	Ignition switch turn to ON, hang transmission to reversing gear	Whether hear buzzer warning	Deal with intermittent fault, turn to next step	Turn to step 3
2	Check intermittent fault	Check and deal with reversing light switch wiring harness connector loosen fault. Check and deal with combination meter wiring harness connector loosen fault			
3	Check reversing light fuse	Dismount reversing light fuse IF20, check whether it is fused?	Whether fuse is fused?	Replace fuse	Next step
4	Check power supply wire of reversing radar control module power supply	Use multimeter to measure voltage between reversing radar control module wiring harness connector F07-12 and ground.	Voltage standard: 11~14 V Whether voltage accord with standard?	Next step	Maintain and check or replace wiring harness
5	Check grounding wire of reversing radar control module	Use multimeter to measure resistance between reversing radar control module wiring harness connector F07-13 and ground.	Resistance standard: less than 1Ω Whether resistance accord with standard?	Next step	Maintain and check or replace wiring harness
6	Check wire between reversing radar control module and reversing light fuse	Hang transmission to reversing gear, use multimeter to measure resistance between reversing radar control module wiring harness connector related pin and reversing light fuse wiring harness connector F07-12.	Resistance standard: less than 1Ω Whether resistance accord with standard?	Next step	Maintain and check or replace wiring harness
7	Remove reversing radar control module, whether fault is removed?	Replace new reversing radar control module. Key turn to ON, hang transmission to reversing gear.	Whether can hear buzzer warning tone?	Fault removed.	

Sensor not work

Step	Detect content	Solution	Judging specification	Next step	
				Yes	No
1	Ensure fault phenomenon	Ignition switch turn to ON, hang transmission to reversing gear, lay appropriate obstacle in appropriate distance behind vehicle.	Whether can hear parking warning tone?	Deal with intermittent fault, turn to next step	Turn to step 3
2	Check intermittent fault	Check and deal with reversing radar sensor wiring harness connector loosen fault			
3	Check wire between reversing radar sensor and reversing radar control module	Measure resistance between reversing radar sensor wiring harness connector RB07-1 and reversing radar control module connector F07-1/2/3/4.	Resistance standard: less than 1Ω Whether resistance accord with standard?	Next step	Maintain and check or replace wiring harness

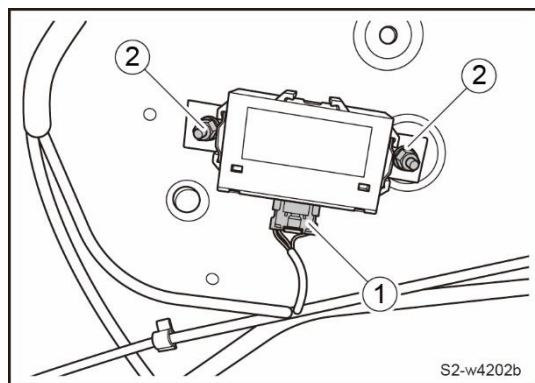
Step	Detect content	Solution	Judging specification	Next step	
				Yes	No
4	Check wire between reversing radar sensor and reversing radar controller	Measure resistance between reversing radar sensor wiring harness connector RB07-2 and reversing radar controller wiring harness connector F07-14.	Resistance standard: less than 1Ω Whether resistance accord with standard?	Next step	Maintain and check or replace wiring harness
5	Check wire between reversing radar sensor and reversing radar controller	Measure resistance between reversing radar sensor wiring harness connector RB07-4 and reversing radar controller wiring harness connector F07-23.	Resistance standard: less than 1Ω Whether resistance accord with standard?	Next step	Maintain and check or replace wiring harness
6	Replace reversing radar sensor, whether fault is removed?	Replace new reversing radar sensor, turn ignition switch to "ON", transmission hang to reversing gear, and getting into reversing state.	Whether can detect obstacle?	Fault is removed.	

III、Reversing Radar Controller Assembly

(I) Removal

1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove tail door threshold assembly Refer to “Tail door threshold assembly”
4. Remove rear door threshold panel assembly Refer to “Rear door threshold panel assembly”
5. Remove rear seat cushion assembly Refer to “Rear seat assembly”
6. Remove rear seat backrest assembly Refer to “Rear seat assembly”
7. Remove backrest hinge bracket Refer to “Lower trim panel assembly of C pillar”
8. Remove lower trim panel of C pillar Refer to “Lower trim panel assembly of C pillar”
9. Remove upper trim panel of C pillar Refer to “Upper trim panel assembly of C pillar”
10. Remove left side trim panel assembly of trunk Refer to “Side trim panel assembly of trunk”
11. Remove reversing radar controller assembly

- 1). Disconnect reversing radar controller assembly wiring harness connector ①;
- 2). Remove 2 fixed nuts ② of reversing radar controller;



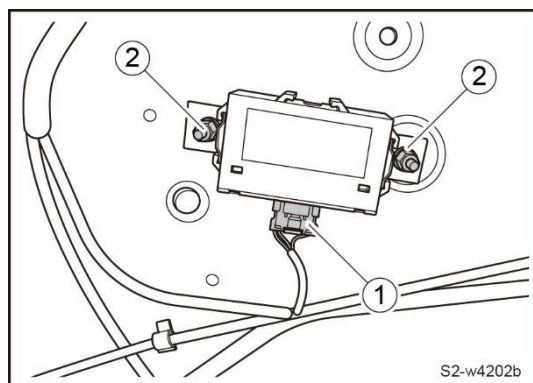
(II) Installation

1. Install reversing radar controller assembly
 - 1). Install and tighten 2 fixed nuts ② of reversing radar controller assembly;

Tighten

torque

4~6N m



- 2). Connect reversing radar controller assembly wiring harness connector ①;

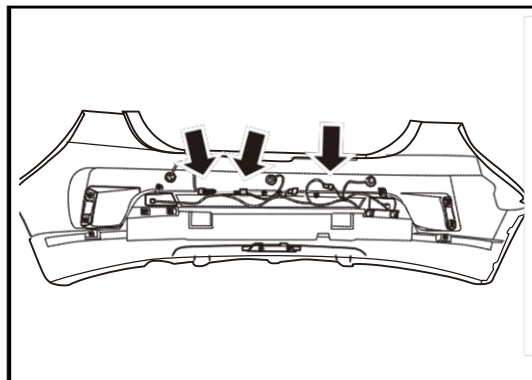
2. Install left side trim panel assembly of trunk
3. Install upper trim panel assembly of C pillar
4. Install lower trim panel assembly of C pillar
5. Install backrest hinge bracket
6. Install rear seat backrest assembly
7. Install rear seat cushion assembly
8. Install rear door threshold panel assembly

9. Install tail door threshold assembly
10. Connect battery negative electrode
11. Close engine cabin cover

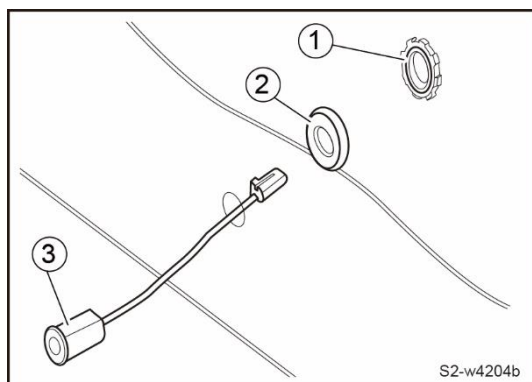
IV、Sensor Assembly

(I) Removal

1. Open engine cabin cover
2. Disconnect battery electrode Refer to “Disconnection and connection of battery electrode”
3. Remove rear side combination light assembly Refer to “Rear side combination light assembly”
4. Remove rear bumper assembly
5. Remove sensor assembly
 - 1). Disconnect sensor assembly wiring harness connector;

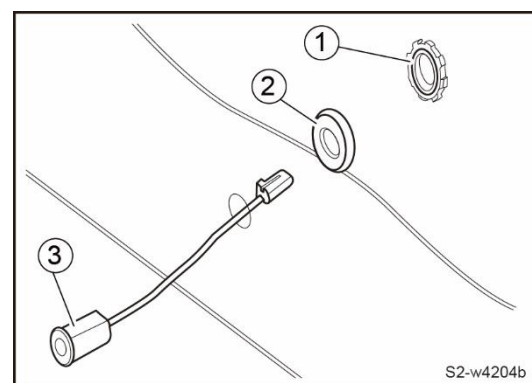


- 2). Rotate clamp ring, and take down lock catch ①;
- 3). Take down rubber cushion ② with shrapnel, and take down sensor ③ from outside;



(II) Installation

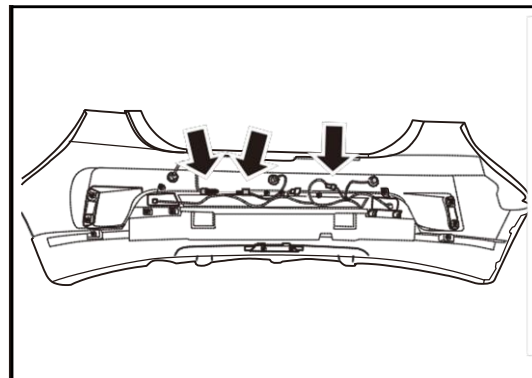
1. Install sensor assembly
 - 1). Install sensor ③ from front bumper, and install rubber cushion ② and clamp ring ① along wiring harness of sensor itself in



turn;

- 2). Press sensor and rotate clamp ring ① clockwise at the same time to make rubber cushion fit with rear bumper rightly;
 △ Note Must align triangle mark of clamp ring to triangle mark of sensor assembly, thus it can tighten rightly.

3). Connect sensor wiring harness connector;



2. Install rear bumper assembly
3. Install rear side combination light assembly
4. Connect battery negative electrode
5. Close engine cabin cover

Wiper and Washer Device

I、 Summary

(I) Structure Overview

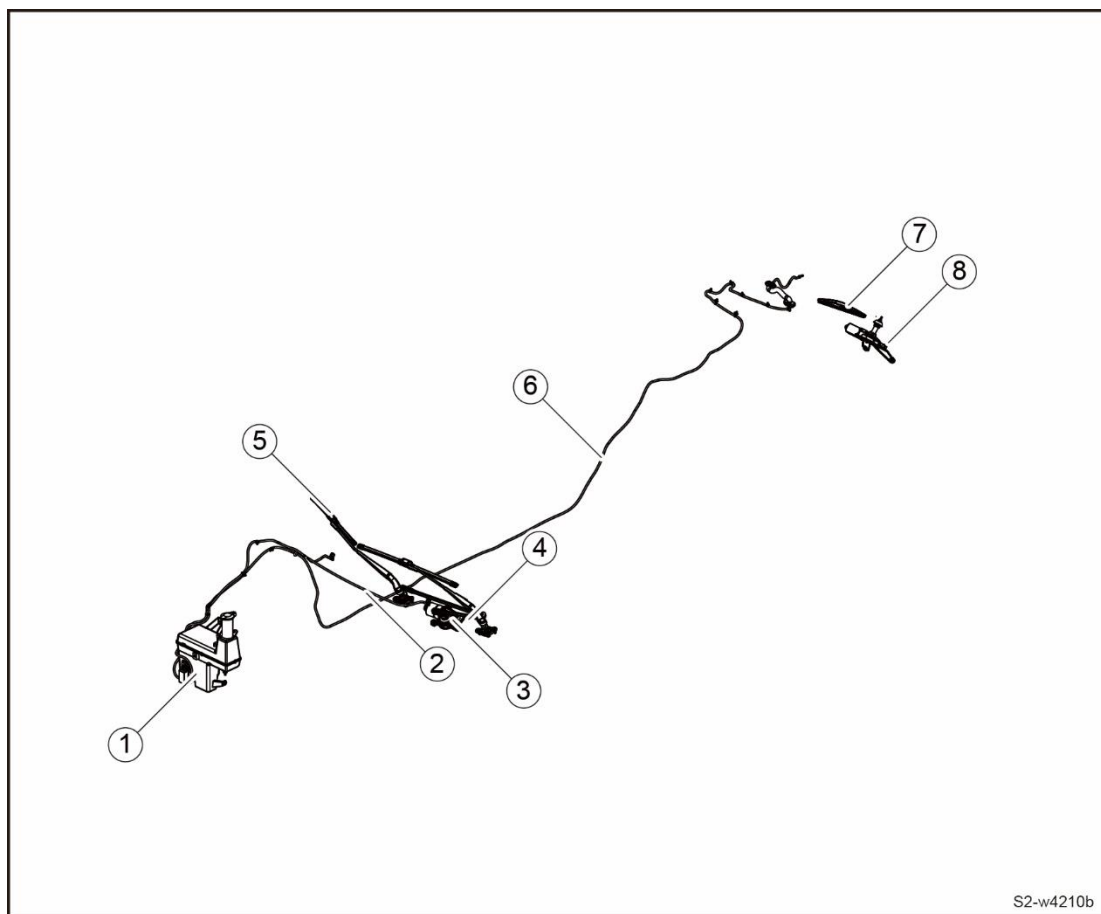
Wiper system:

Wiper has four control mode: high speed, low speed, intermittent and inching. Wiper switch is on right side operating lever of turning column. Front wiper system consists of wiper switch, washing liquid pot and motor, front wiper connecting rod mechanism, front wiper motor, wiper arm and wiper blade. Rear wiper system consists of rear wiper switch, washing liquid pot and motor, rear wiper motor, wiper arm and wiper blade.

Washer System:

Washer system consists of window cleaner, washing pipe, washing liquid pot and washing motor assembly, front spraying nozzle, rear spraying nozzle and washing switch. Washing liquid pot is installed under right front headlight, wiper motor is fixed on washing liquid pot, washing motor sends washing liquid to front spray nozzle or rear spray nozzle through washing water pipe.

Component Position

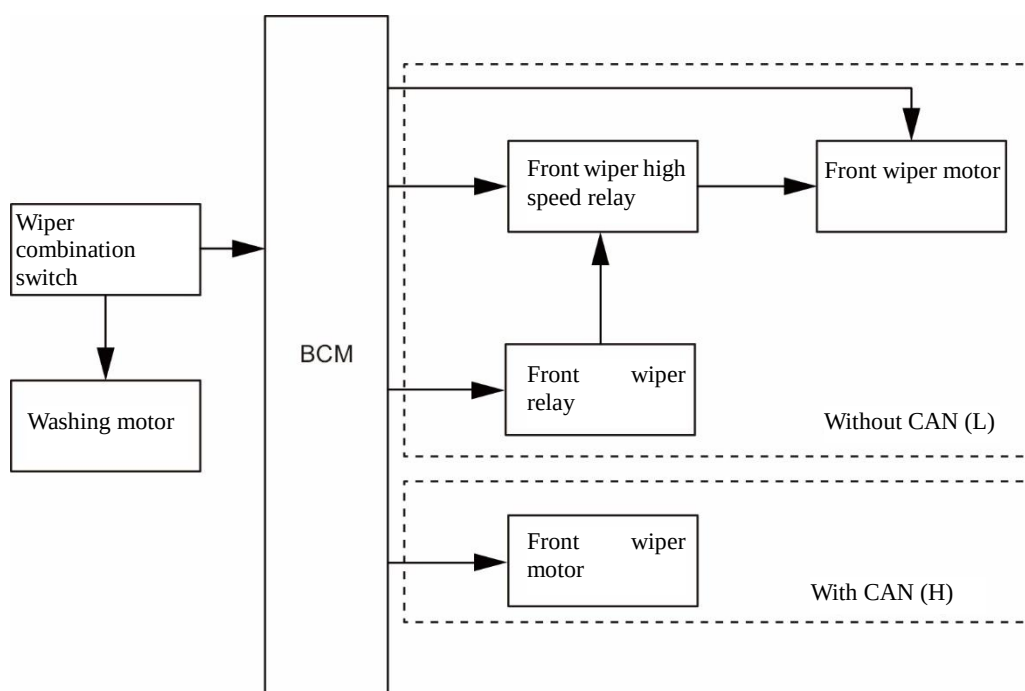


1. Washing liquid pot and motor assembly
2. Front washing water pipe assembly
3. Front wiper motor assembly
4. Front wiper connecting rod mechanism assembly

5. Front wiper arm, wiper blade
6. Rear wiper water pipe assembly
7. Rear wiper arm and blade
8. Rear wiper motor assembly

(II) Operation Principle

Front Wiper Schematic Diagram



(III) Torque Parameter

No.	Item	Torque (N m)
1	Front wiper motor and connecting rod mechanism assembly fixed bolt	10~12
2	Wiper arm assembly installation nut	13~17
3	Washing liquid pot fixed bolt	8~10

(IV) Maintenance Note

1. Before disassembling wiper motor and connecting rod assembly, ensure connecting rod stop at autostop position.
2. Before installing wiper motor and connecting rod, ensure to connect wiper motor and wiring harness connector, when connecting you will hear “clatter” sound, it means good connect.
3. When installing wiper arm and blade assembly, it need to supply power to wiper motor, after wiper motor working for 10s, close wiper switch by operating combination switch rightly, to make wiper motor stop at autostop position.
4. Wiper blade is installed to window's fixed position.
5. If wiper blade work not normally, use good cleaner or gentle cleaner cleaning door window and wiper blade, and thoroughly clean with clean water.
6. When maintaining washing pump, be careful not damage washing pump seal ring.
7. Before add water to storing box, check filter whether there is outside impurity or pollution. Clean filter if needed.
8. Before installing washing motor, check whether there is impurity or pollution, if needed, clean filter and wiper motor.

II、Troubleshooting

(I) Troubleshooting List

NO.	Fault phenomenon	Fault reason analysis	Solution	Remark
1	Stop work	Moving part stuck	Remove stuck fault	
		Power supply disconnected, connector pin drop	Connect power supply	
		Motor burn down	Replace new motor	
2	Abnormal sound, work abnormally	Motor interior abnormal sound happen	Replace motor	
		Connecting rod has friction phenomenon when moving	Remove friction phenomenon	
		Wiper blade and window has abnormal sound	Clean window	
3	When wiping, wiper blade has shaking phenomenon	Window and wiper blade resistance too high	Clean window and wiper blade, or replace wiper blade	
			Regulate relative angle of wiper arm and window, or replace wiper arm	
4	Wiper blade not horizontal when back to original position	Relative position of wiper blade changed	After motor back to original position, take down wiper arm and re-install, keep wiper blade horizontal	
5	Wiping not clean	Window not clean	Clean window	
		Wiper blade worn seriously	Replace wiper blade(replace wiper blade every three month is proposed)	
6	No matter what position wiper switch is, wiper and washer not work	Whether engine compartment electrical box fuse and indoor electrical box fuse is damaged	Replace fuse	Refer to "Wiper and washer motor not work"
		Other circuit fault	Remove fault that caused by other circuit	
		Motor power supply and grounding not abnormal	Check whether pin and grounding pin voltage is normal	
		Wiper motor and washer motor damaged	Replace wiper motor and washer motor	
		Wiper switch damaged	Replace wiper switch	
7	Only front wiper high speed not work	Wiper motor 4 th pin and 1 st pin not connected	Replace wiper motor	Refer to "Front wiper high speed not work"
		Wiper motor pin 4 th and wiper combination switch connect not connected	Maintain or replace motor pin 4 th and combination switch connected wire	
		Wiper combination switch 9 th and 10 th pin not connected	Replace combination switch	
		Connected wire between combination switch 10 th pin and grounding point not connected	Maintain or replace connected wire between wiper combination switch 10 th pin and grounding point	
8	Only front wiper low	Wiper motor 3rd pin and 1st pin not connected	Replace wiper motor	Refer to

NO.	Fault phenomenon	Fault reason analysis	Solution	Remark
	speed not work	Wiper motor 3 rd pin and wiper combination switch connected wire not normal	Maintain or replace motor 3 rd pin and wiper combination switch connected wire	“Front wiper low speed not work”
		Wiper combination switch 3 rd pin and 10 th pin not connected	Replace combination switch	
		Connected wire between wiper combination switch 10 th pin and grounding point not connected	Maintain or replace connected wire between wiper combination switch 10 th pin and grounding point	
9	Only front wiper intermittence work	Conduction of wiper combination switch pin is not normal	Replace wiper combination switch	Refer to “Front wiper intermittence not work”
		Connected wire between wiper combination switch 8 th pin and BCM is not breakover	Maintain or replace connected wire between wiper combination switch 8 th pin and BCM	
		Connected wire between wiper is not breakover	Maintain or replace connected wire between wiper relay and BCM	
		Wiper relay pin not connected with ground	Wiper relay	
			Replace BCM	
10	Wiper always on	Wiper combination switch all switch conduction is not normal	Replace wiper combination switch	
		Connected wire between wiper combination switch and wiper motor is not normal	Replace wiper motor	
		Connected wire between wiper combination switch and wiper motor is not normal	Maintain or replace connected wire between wiper combination switch and wiper motor	
11	Washer motor not work	Washer motor power supply not normal	Maintain or replace power supply circuit of washer motor	
		Wiper combination switch 10 th pin and 11 th not conduct	Replace wiper combination switch	
		Connected wire between wiper combination switch and washer motor is not normal	Maintain or replace connected wire between wiper combination switch and washer motor	
		Washer motor damaged	Replace washer motor	

(II) Troubleshooting Flow Chart
Wiper and washer motor not work

Step	Detect content	Solution	Judging specification	Next step	
				Yes	No
1	Check battery power supply capacity	Measure battery voltage	Voltage standard: 11~14 V	Next step	Battery charging or replace battery
2	Check intermittent fault	Check wiper motor, wiper combination switch, whether wiper motor wiring harness connector is loosen?	Whether loosen or drop?	Connect wiring harness connector again tightly	Next step
3	Check wiper motor, washer motor fuse	Disassemble fuse, check whether fuse is fused?	Whether fuse is fused?	Replace fused fuse	Next step
4	Replace wiper combination switch, whether fault is removed?	Install new wiper combination switch, ignition switch to ON, operate wiper combination switch	Whether front and rear wiper and washer motor is working?	Fault removed	Next step
5	Replace front and rear wiper motor and washer motor, whether fault is removed?	Install new front and rear wiper motor and washer motor, operate wiper combination switch	Whether front and rear wiper and washer motor is working?	Fault removed	Next step
6	Replace BCM, whether fault is removed?	Install new BCM, operate wiper combination switch	Whether front and rear wiper and washer motor is working?	Fault removed	Next step
7	Replace wiring harness, whether fault is removed?	Install new wiring harness, operate wiper combination switch	Whether front and rear wiper and washer motor is working?	Fault removed	

Front wiper high speed not work

Step	Detect content	Solution	Judging specification	Next step	
				Yes	No
1	Check front wiper motor high speed working power supply	Disconnect front wiper motor wiring harness connector, ignition switch to ON, turn wiper combination switch to front wiper high speed. Measure voltage between front wiper motor wiring harness connector E09-4 and ground	Voltage standard: 11~14V Whether voltage is accord with standard?	Replace front motor	Turn to step 3
2	Replace front wiper motor, whether fault is removed?	Install new front wiper motor, ignition switch to ON, turn wiper combination switch to front wiper high speed	Whether front wiper high speed work?	Fault removed	Next step

Step	Detect content	Solution	Judging specification	Next step	
				Yes	No
3	Check connected wire between front wiper motor wiring harness connector E09-4 and front wiper high speed relay ER04-87(L) pin or BCM wiring harness connector M33-15(H) pin	Measure resistance between front wiper motor wiring harness connector E09-4 and front wiper high speed relay ER04-87(L) pin or BCM wiring harness connector M33-15(H) pin	Standard resistance: less than 1Ω	Next step	Maintain or replace wiring harness
4	Measure circuit between combination switch wiring harness connector M11-9 pin and BCM wiring harness connector M32-15(L) pin (BCM not with CAN) or M31-13(H) pin	Measure resistance between combination switch wiring harness connector M11-9 pin and BCM wiring harness connector M32-15(L) pin (BCM not with CAN) or M31-13(H) pin	Standard resistance: less than 1Ω	Next step	Maintain or replace wiring harness
5	Replace front wiper high speed relay, whether fault is removed?	Install new front wiper high speed relay, ignition switch to ON, turn wiper combination switch to front wiper high speed	Whether front wiper high speed work?	Fault removed	Next step
6	Replace front wiper combination switch, whether fault is removed?	Install new front wiper high speed relay, ignition switch to ON, turn wiper combination switch to front wiper high speed	Whether front wiper high speed work?	Fault removed	Next step
7	Replace BCM, whether fault is removed?	Install new BCM, ignition switch to ON, turn wiper combination switch to front wiper high speed	Whether front wiper high speed work?	Fault removed	Next step

Front wiper high speed not work

Step	Detect content	Solution	Judging specification	Next step	
				Yes	No
1	Check front wiper motor low speed working power supply	Disconnect front wiper motor wiring harness connector, ignition switch to ON, turn wiper combination switch to front wiper low speed. Measure voltage between front wiper motor wiring harness connector E09-3 and ground	Voltage standard: 11~14V	Replace front motor	Turn to step 3
2	Replace front wiper motor, whether fault is removed?	Install new front wiper motor, ignition switch to ON, turn wiper combination switch to front wiper low speed	Whether front wiper high speed work?	Fault removed	Next step

Step	Detect content	Solution	Judging specification	Next step	
				Yes	No
3	Check connected wire between front wiper motor wiring harness connector E09-3 and front wiper high speed relay EPDR4-87a(L) pin or BCM wiring harness connector M31-21(H) pin	Measure resistance between front wiper motor wiring harness connector E09-3 and front wiper high speed relay EPDR4-87a(L) pin or BCM wiring harness connector M31-21(H) pin	Standard resistance: less than 1Ω	Next step	Maintain or replace wiring harness
4	Measure circuit between combination switch wiring harness connector M11-3 pin and BCM wiring harness connector M32-3(L) pin or M31-16(H) pin	Measure resistance between combination switch wiring harness connector M11-3 pin and BCM wiring harness connector M32-3(L) pin or M31-16(H) pin	Standard resistance: less than 1Ω	Next step	Maintain or replace wiring harness
5	Replace front wiper high speed relay, whether fault is removed?	Install new front wiper high speed relay, ignition switch to ON, turn wiper combination switch to front wiper low speed	Whether front wiper low speed work?	Fault removed	Next step
6	Replace front wiper combination switch, whether fault is removed?	Install new front wiper high speed relay, ignition switch to ON, turn wiper combination switch to front wiper low speed	Whether front wiper low speed work?	Fault removed	Next step
7	Replace BCM, whether fault is removed?	Install new BCM, ignition switch to ON, turn wiper combination switch to front wiper low speed	Whether front wiper low speed work?	Fault removed	

Front wiper intermittent speed not work

Step	Detect content	Solution	Judging specification	Next step	
				Yes	No
1	Check front wiper motor intermittent speed working power supply	Disconnect front wiper motor wiring harness connector, ignition switch to ON, turn wiper combination switch to front wiper low speed. Measure voltage between front wiper motor wiring harness connector E09-3 and ground	Voltage standard: 11~14V	Replace front motor	Turn to step 3
2	Replace front wiper motor, whether fault is removed?	Install new front wiper motor, ignition switch to ON, turn wiper combination switch to front wiper intermittent speed	Whether front wiper intermittent speed work?	Fault removed	Next step

Step	Detect content	Solution	Judging specification	Next step	
				Yes	No
3	Check connected wire between front wiper motor and BCM	Measure resistance between wiper motor wiring harness connector E09-3 and BCM wiring harness connector ER4-87a(L) pin or H23-21(H) pin	Standard resistance: less than 1Ω, Whether resistance is accord with standard?	Next step	Maintain or replace wiring harness
4	Check circuit between wiper combination switch and BCM	Measure resistance between wiper combination switch M11-8 pin and BCM wiring harness connector M32-19(L) pin or M03-21(H) pin	Standard resistance: less than 1Ω	Next step	Maintain or replace wiring harness
5	Check circuit between wiper combination switch and body ground	Measure resistance between wiper combination switch wiring harness connector M11-10 pin and vehicle body	Standard resistance: less than 1Ω, Whether resistance is accord with standard?	Next step	Maintain or replace wiring harness
6	Replace front wiper combination switch, whether fault is removed?	Install new front wiper high speed relay, ignition switch to ON, turn wiper combination switch to front wiper intermittent speed	Whether front wiper intermittent speed work?	Fault removed	Next step
7	Replace BCM, whether fault is removed?	Install new BCM, ignition switch to ON, turn wiper combination switch to front wiper intermittent speed	Whether front wiper intermittent speed work?	Fault removed	

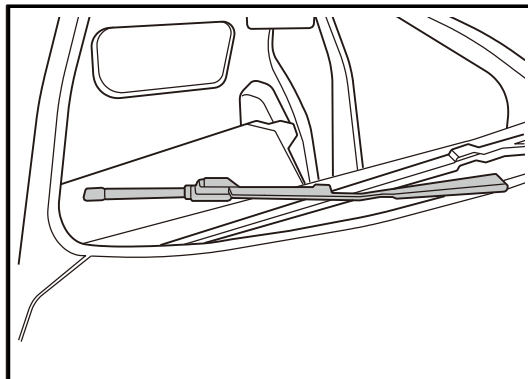
III、Front Wiper Blade Assembly

(I) Removal

1. Remove front wiper blade assembly

- 1). Lift up front wiper arm;
- 2). Press connection point, pull upward, and disconnect connection of front wiper blade and arm;
- 3). Take down front wiper blade assembly;

△ Note Don't operate wiper blade violently when removing, or else it will damage wiper blade and effect wiping.

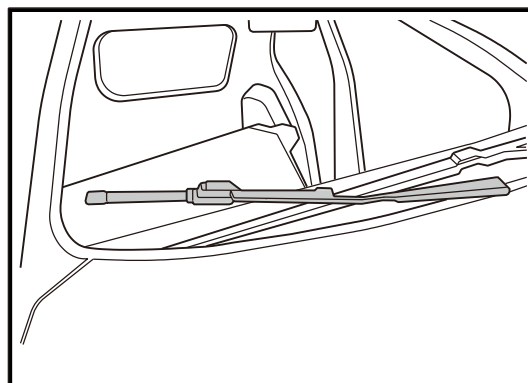


(II) Installation

1. Install front wiper blade assembly

- 1). Insert wiper blade into slipping sleeve of wiper arm, and ensure to be connected in place;
- 2). Put off front wiper arm;

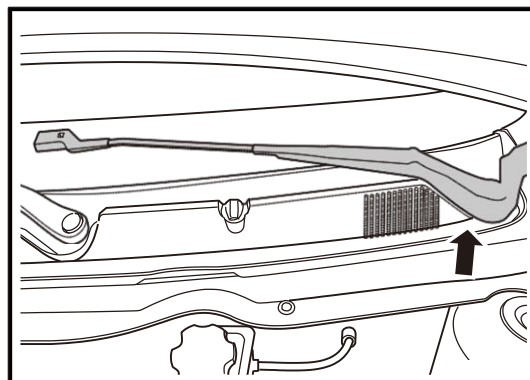
△ Note Wiper blade installed to front windshield is installed in location point, which is installed in place.



IV、Front Wiper Arm Assembly

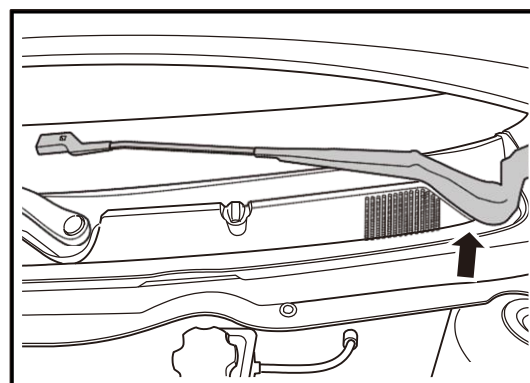
(I) Removal

1. Remove front wiper blade assembly Refer to “Front wiper blade assembly”
2. Remove front wiper arm assembly
 - 1). Pry front wiper bonnet;
 - 2). Mark on front wiper arm and fixed nut, remove front wiper arm fixed nut, and take down front wiper arm assembly;



(II) Installation

1. Install front wiper arm assembly
 - 1). Install front wiper arm assembly and tighten fixed nut to marked position;
Tighten torque 13~17N m
 - 2). Install front wiper bonnet;
△Note First supply power to wiper motor before installing to let wiper motor work about 10s, and then operate combination switch to close wiper to let wiper motor stop at stop position.



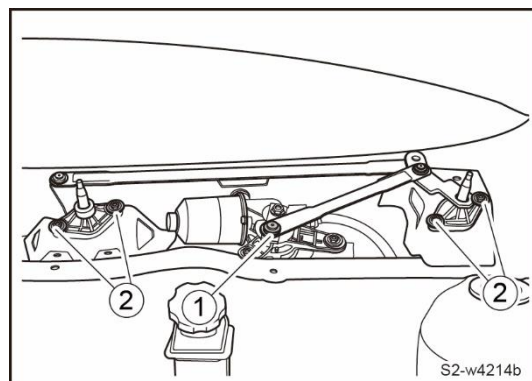
2. Install front wiper blade assembly

V、Front Wiper Connecting Rod Mechanism Assembly

(I) Removal

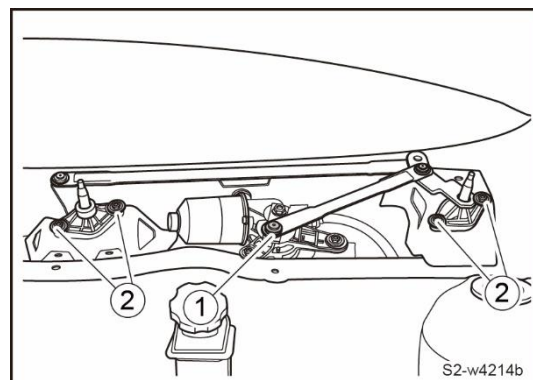
1. Open engine cabin cover
2. Remove front wiper arm assembly Refer to “Front wiper arm assembly”
3. Remove ventilation cover plate Refer to “Ventilation cover plate”
4. Remove front wiper connecting rod mechanism assembly
 - 1). Disconnect connection ball head ① of front wiper connecting rod mechanism assembly and motor;
 - 2). Remove 4 fixed bolts ② of front wiper connecting rod mechanism assembly;
 - 3). Take down front wiper connecting rod mechanism assembly;

△ Note Ensure connecting rod is in automatic stop position when removing.



(II) Installation

1. Install front wiper connecting rod mechanism assembly
 - 1). Place front wiper connecting rod mechanism assembly to installation position, and tighten 4 fixed bolts ② of front wiper connecting rod mechanism assembly;
 - Tighten torque 10~12N m
 - 2). Connect connection ball head ① of front wiper connecting rod mechanism assembly and motor;

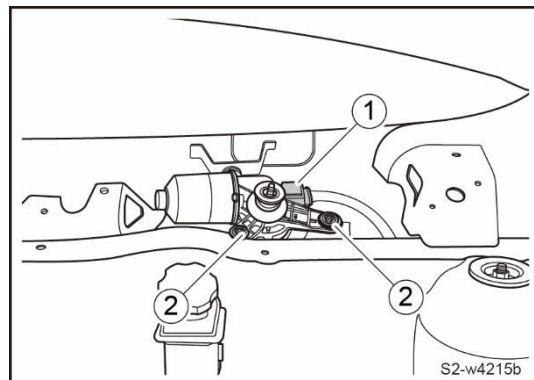


2. Install ventilation cover plate
3. Install front wiper connecting rod mechanism assembly
4. Close engine cabin cover

VI、Front Wiper Motor Assembly

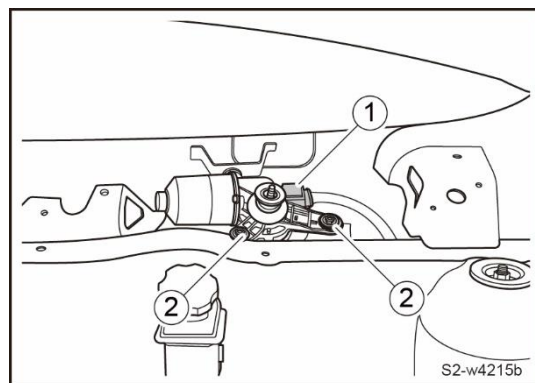
(I) Removal

1. Open engine cabin cover
2. Remove battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove front wiper arm assembly Refer to “Front wiper arm assembly”
4. Remove ventilation cover Refer to “Ventilation cover”
5. Remove front wiper connecting rod mechanism assembly Refer to “Front wiper connecting rod mechanism assembly”
6. Remove front wiper motor assembly
 - 1). Remove wiring harness connector ① of front wiper motor assembly;
 - 2). Remove 2 fixed bolts ② of front wiper motor assembly;
 - 3). Take down front wiper motor assembly;



(II) Installation

1. Install front wiper motor assembly
 - 1). Place front wiper motor assembly to installation position, and tighten 2 fixed bolts ② of front wiper motor assembly;
Tighten torque 10~12N m
 - 2). Connect wiring harness connector ① of front wiper motor assembly;



2. Install front wiper connecting rod mechanism assembly
3. Install ventilation cover
4. Install front wiper arm assembly
5. Connect battery negative electrode
6. Close engine cabin cover

VII、 Front Windshield Nozzle

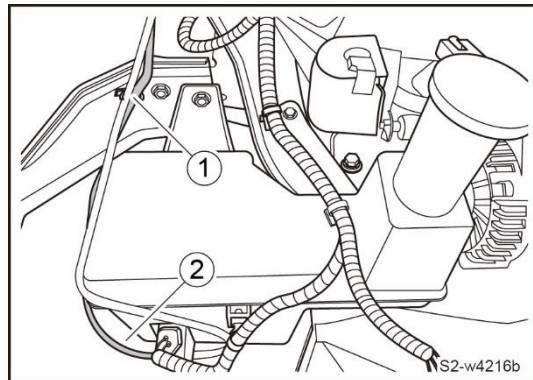
(I) Removal

Refer to ventilation cover.

VIII、Front Washing Water Pipe Assembly

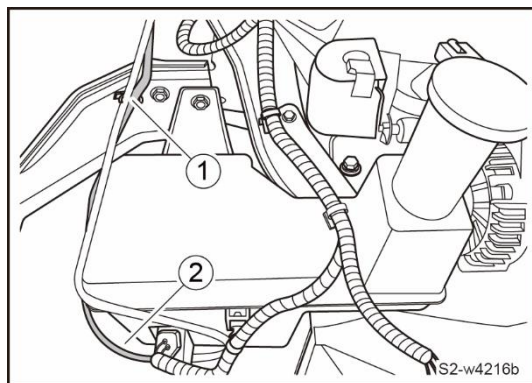
(I) Removal

1. Open engine cabin cover
2. Remove front wiper arm assembly Refer to “Front wiper arm assembly”
3. Remove ventilation cover Refer to “Ventilation cover”
4. Remove front washing water pipe assembly
 - 1). Remove fixed buckles ① of front washing water pipe assembly and vehicle body;
 - 2). Disconnect connection ② of front washing water pipe assembly and washing motor;
 - 3). Take down front washing water pipe assembly;



(II) Installation

1. Install front washing water pipe assembly
 - 1). Connect front washing water pipe assembly ② and washing motor;
 - 2). Install fixed buckle ① of front washing water pipe assembly and vehicle body;

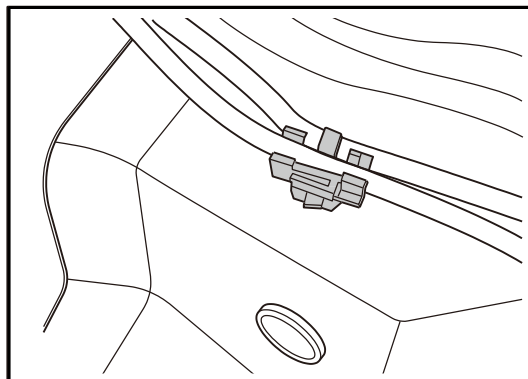


2. Install ventilation cover
3. Install front wiper arm assembly
4. Close engine cabin cover

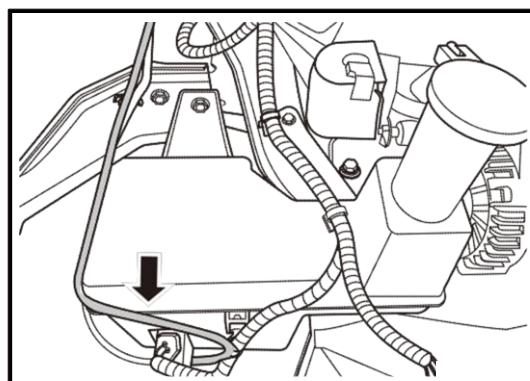
IX、Rear Washing Water Pipe Assembly

(I) Removal

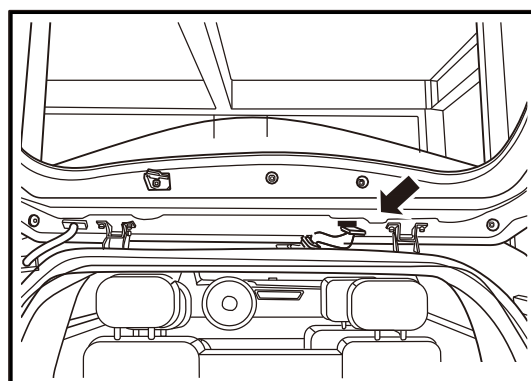
1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove front wheel cover (right) Refer to “Front wheel cover”
4. Remove glove box assembly Refer to “Glove box assembly”
5. Remove front door threshold panel assembly (right) Refer to “front door threshold panel assembly”
6. Remove lower trim panel assembly (right) of A pillar Refer to “Lower trim panel assembly of A pillar”
7. Remove rear door threshold panel assembly (right) Refer to “Rear door threshold panel assembly”
8. Remove lower trim panel assembly (right) of B pillar Refer to “Lower trim panel assembly of B pillar”
9. Remove rear seat cushion assembly Refer to “Rear seat assembly”
10. Remove rear seat backrest assembly Refer to “Rear seat assembly”
11. Remove fixed bracket assembly (right) under rear seat backrest Refer to “Upper trim panel assembly of C pillar”
12. Remove upper trim panel assembly (right) of C pillar Refer to “Upper trim panel assembly of C pillar”
13. Remove lower trim panel assembly (right) of C pillar Refer to “Lower trim panel assembly of C pillar”
14. Remove upper trim panel assembly (right) of A pillar Refer to “Upper trim panel assembly of A pillar”
15. Remove upper trim panel assembly (right) of B pillar Refer to “Upper trim panel assembly of B pillar”
16. Remove sun visor assembly (left/right) Refer to “Sun visor assembly”
17. Remove platfond handle assembly (right front/left rear/right rear) Refer to “Platfond handle assembly”
18. Remove front top light assembly Refer to “Front top light assembly”
19. Remove platfond assembly Refer to “Platfond assembly”
20. Remove rear washing water pipe assembly
 - 1). Remove fixed buckle of rear washing water pipe assembly and vehicle body;



- 2). Disconnect connection of rear washing water pipe assembly and washing motor;

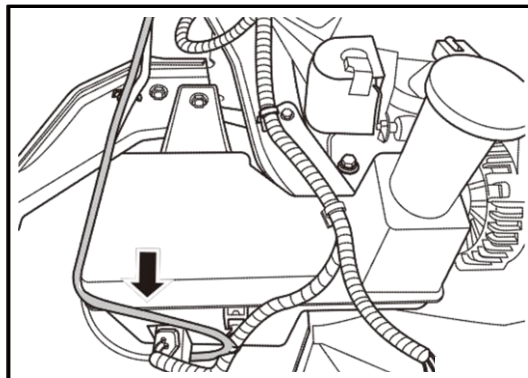


- 3). Pull out water pipe sleeve, and disconnect connection of rear water pipe and vehicle water pipe;
- 4). Take down rear washing water pipe assembly;

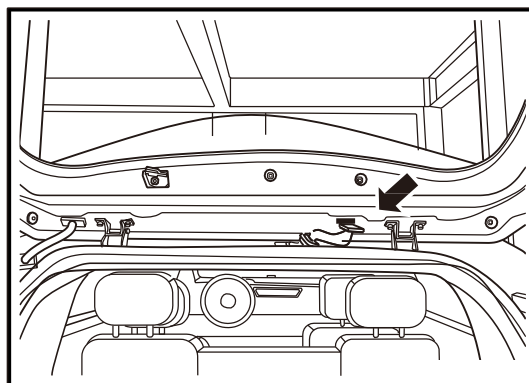


(II) Installation

1. Install rear washing water pipe assembly
 - 1). Place rear washing water pipe assembly to installation position;
 - 2). Connect rear washing water pipe assembly and washing motor;
 - 3). Install fixed buckle of rear washing water pipe assembly and vehicle body;



- 4). Connect rear washing water pipe assembly and vehicle body water pipe, and install water pipe sleeve;



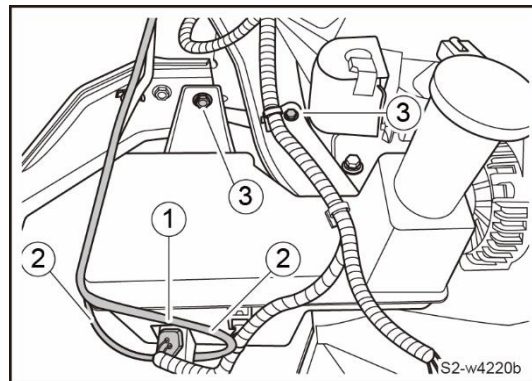
2. Install platfond assembly
3. Install front top light assembly
4. Install platfond handle assembly (right front, left rear, right rear)
5. Install sun visor assembly (left/right)
6. Install upper trim panel assembly (right) of B pillar
7. Install upper trim panel assembly (right) of A pillar
8. Install upper trim panel assembly (right) of C pillar
9. Install lower trim panel assembly (right) of C pillar
10. Install fixed bracket assembly (right) of rear seat backrest
11. Install rear seat backrest assembly
12. Install rear seat cushion assembly
13. Install lower trim panel assembly (right) of B pillar
14. Install rear door threshold panel assembly (right)
15. Install lower trim panel assembly (right) of A pillar
16. Install front door threshold panel assembly (right)
17. Install glove box assembly
18. Install front wheel cover (right)
19. Connect battery negative electrode
20. Close engine cabin cover

X、Washing Liquid Pot and Motor Assembly

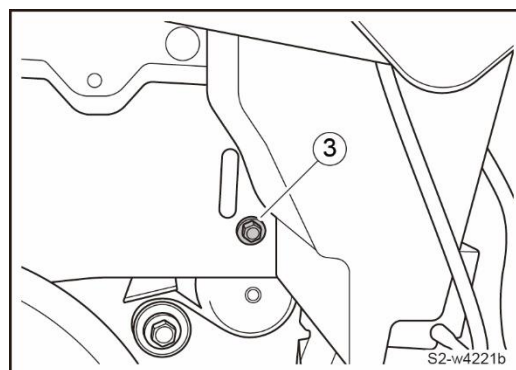
(I) Removal

1. Open engine cabin cover
2. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
3. Remove front wheel cover (right) Refer to “Front wheel cover”
4. Remove washing liquid pot and motor assembly

- 1). Disconnect wiring harness connector ① of washing liquid pot and motor assembly;
- 2). Disconnect connection ② of washing motor and front/rear washing water pipe;
- 3). Remove 3 fixed bolts ③ of washing liquid pot and motor assembly and vehicle body;



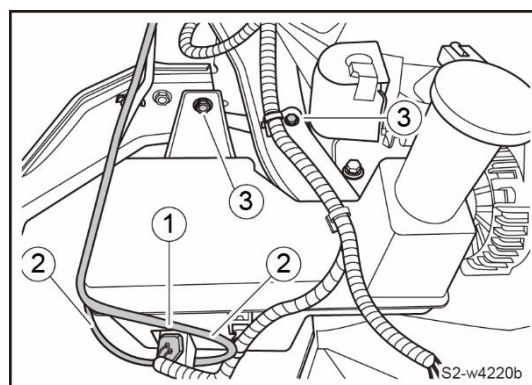
- 4). Take down washing liquid pot and motor assembly;



(II) Installation

1. Install washing liquid pot and motor assembly
 - 1). Place washing liquid pot and motor assembly to installation position, and tighten 3 fixed bolts ③ of washing liquid pot and motor assembly and vehicle body;
Tighten torque 8~10N m
 - 2). Connect connection ② of washing motor and front/rear washing water pipe;
 - 3). Connect wiring harness connector ① of washing liquid pot and motor assembly;

△ Note Before installing washing motor, check whether there is impurity or pollution, if necessary, clean washing motor.

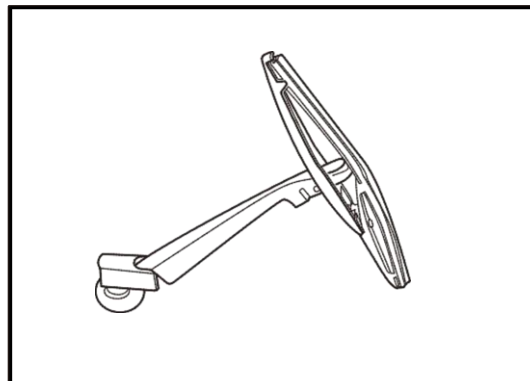


2. Install front wheel cover (right)
3. Connect battery negative electrode
4. Close engine cabin cover

XI、Rear Wiper Blade Assembly

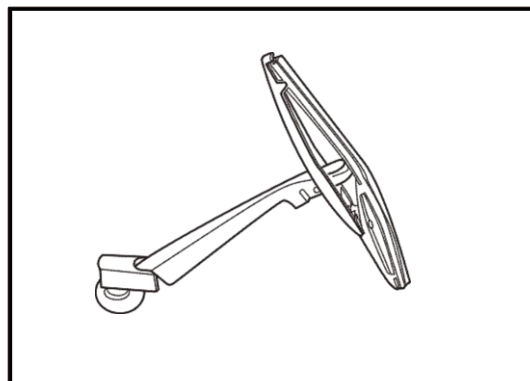
(I) Removal

1. Remove rear wiper blade assembly
 - 1). Lift rear wiper arm;
 - 2). Turn rear wiper blade assembly;
 - 3). Take down rear wiper blade assembly;



(II) Installation

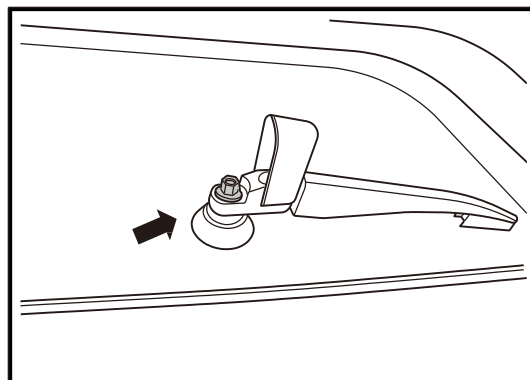
1. Install rear wiper blade assembly
 - 1). Lift rear wiper arm;
 - 2). Align groove of rear wiper blade to rear wiper arm, and turn rear wiper blade assembly. Ensure to be installed in place;



XII、Rear Wiper Arm Assembly

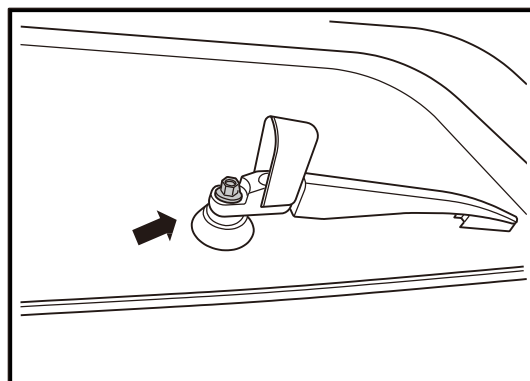
(I) Removal

1. Remove rear wiper blade assembly Refer to “Rear wiper blade assembly”
2. Remove rear wiper arm assembly
 - 1). Pry nut cover of rear wiper arm assembly;
 - 2). Remove fixed nut of rear wiper arm assembly, and take down rear wiper arm assembly;



(II) Installation

1. Install rear wiper arm assembly
 - 1). Place rear wiper arm assembly to installation position, and tighten fixed nut of rear wiper arm assembly;
 - 2). Cover nut cover of rear wiper arm assembly;

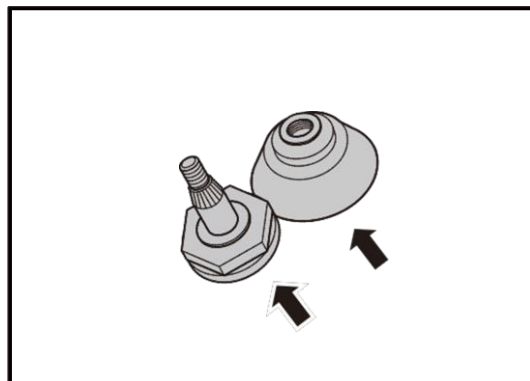


2. Install rear wiper blade assembly

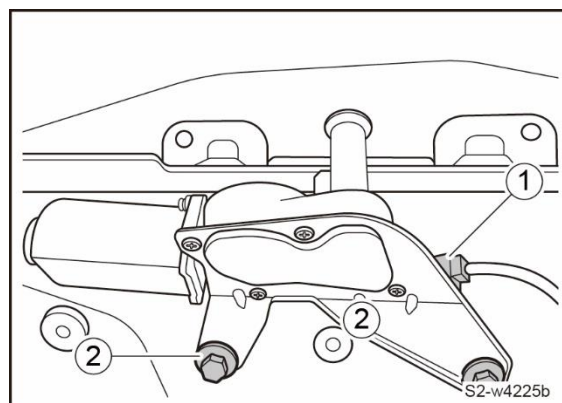
XIII、Rear Wiper Motor Assembly

(I) Removal

1. Open tail door
2. Open engine cabin cover
3. Disconnect battery negative electrode Refer to “Disconnection and connection of battery electrode”
4. Remove rear wiper arm assembly Refer to “Rear wiper arm assembly”
5. Remove tail door trim panel assembly Refer to “Tail door trim panel assembly”
6. Remove rear wiper motor assembly
 - 1). Pry sealing cover of rear wiper motor assembly;
 - 2). Remove fixed nut of rear wiper motor assembly and rear windshield assembly;

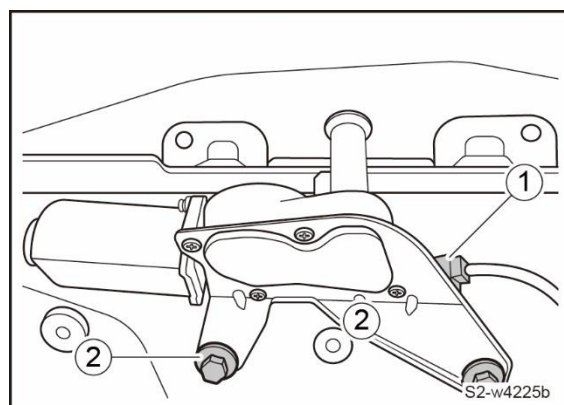


- 3). Disconnect wiring harness connector ① of rear wiper motor assembly;
- 4). Remove 2 fixed bolts ② of rear wiper motor assembly and vehicle body;
- 5). Take down rear wiper motor assembly;



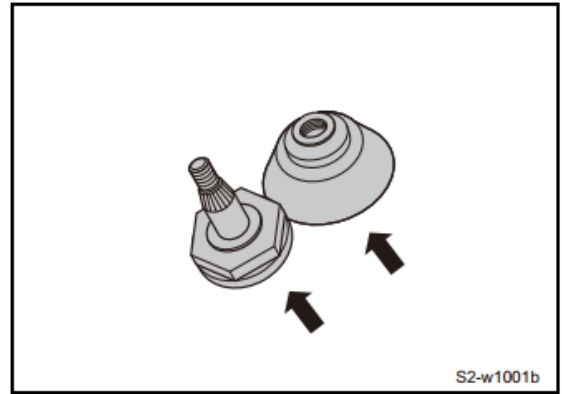
(II) Installation

1. Install rear wiper motor assembly
 - 1). Place rear wiper motor assembly to installation position, and tighten 2 fixed bolts ② of rear wiper motor assembly and vehicle body;
 - 2). Connect wiring harness connector ① of rear wiper motor assembly;



- 3). Tighten fixed nut of rear wiper motor assembly and rear windshield assembly;
- 4). Install sealing cover of rear wiper motor assembly;

2. Install tail door trim panel assembly
3. Close tail door
4. Install rear wiper arm assembly
5. Connect battery negative electrode
6. Close engine cabin cover



XIV、Rear Windshield Spraying Nozzle

Refer to “High position brake light”.

Engine Anti-theft System

I、Summary

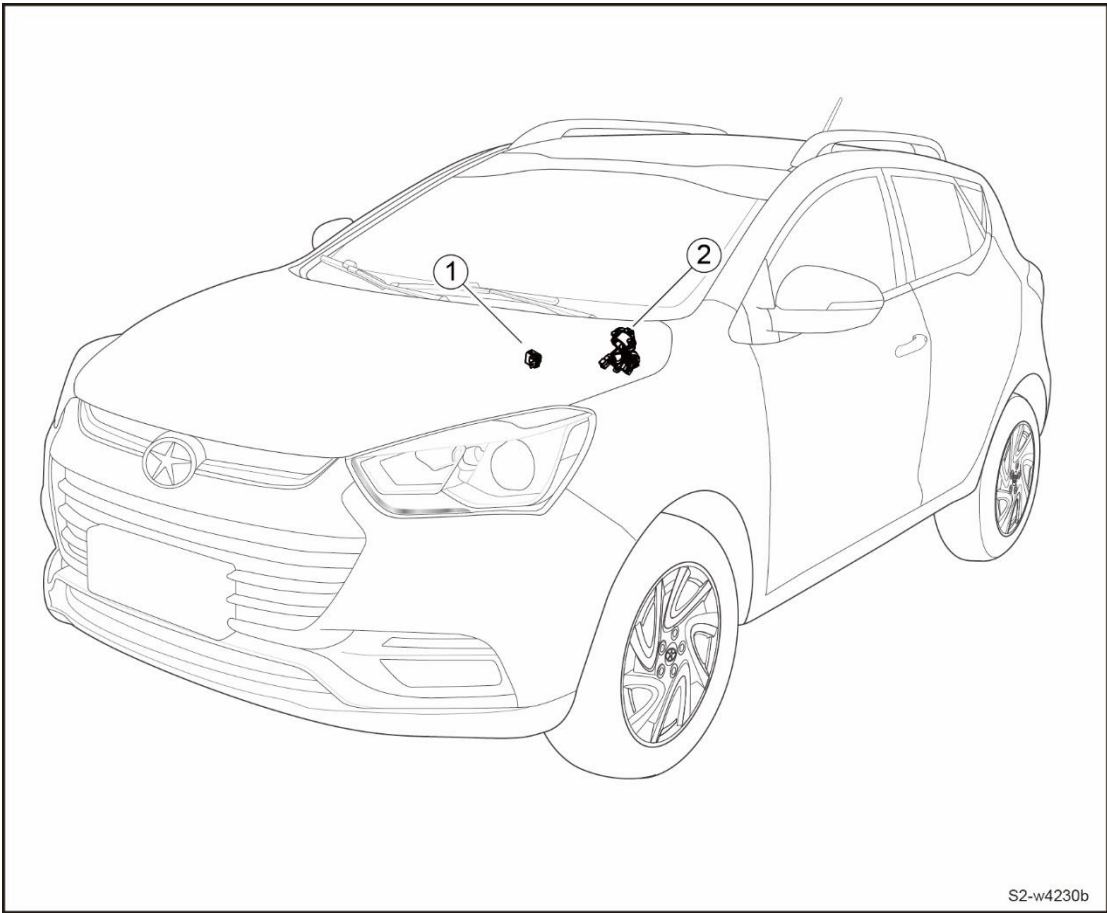
(I) Structure overview

Engine anti-theft system is through two electronic encryption ways, namely Transponder and anti-theft controller (IMMO), IMMO and ECM, to achieve anti-theft function. After IMMO through wireless authentication with Transponder, wired authentication with ECM, and if is authentic, ECM will ignition and injection fuel normally; if not, vehicle will not start, thus to achieve encryption anti-theft to make vehicle more reliable and safer.

Anti-theft system consists of 4 units: anti-theft indicating light (integrated in dashboard), anti-theft controller, transponder and anti-theft interaction coil; detail constitution is shown below:

Component name	Number	Remark
Anti-theft controller	1	Installed in lower tube beam bracket of dashboard
Transponder	2	Separately installed in two keys
Anti-theft interaction coil	1	Installed in ignition switch
Warning indicating light	1	Integrated in combination meter

Component position



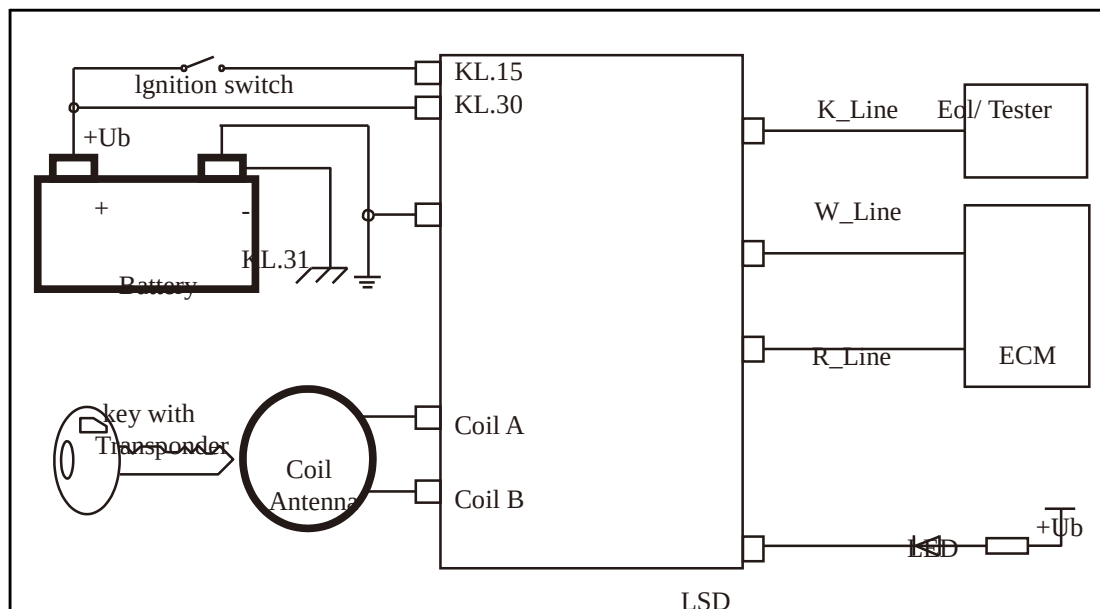
1. Anti-theft controller

2. Anti-theft interaction coil

(II) Operation principle

When turning key from OFF to ON, electronic anti-theft controller assembly outputs anti-theft authentication signal, transforms anti-theft authentication signal to corresponding magnetic field through electronic anti-theft interaction coil, transponder obtains energy and information in magnetic field, and produces magnetic field by interior coil after deciphering and encrypting information, electronic anti-theft interaction coil transforms magnetic field produced by transponder to electric signal, and transports the signal to electronic anti-theft controller assembly. Electronic anti-theft controller assembly deciphers and certificate after receiving transponder information, if data is coincident, authentication is passed, or else authentication failed.

Electrical Principle Diagrammatic Sketch



(III) Maintenance Note

Re-match if replacing key, anti-theft controller and any part of engine control module, and detail matching process please refer to diagnosis device using manual.

Note: 3 kinds of twinkling mode of IMMO indicating light: When vehicle KL.30 is on, key is in KL.15 OFF, indicating light twinkles in every 5s, each period indicating light is on for 250ms; When key to KL.15 ON, if anti-theft authentication is passed, indicating light is off, and keep in always off state; if authentication failed, indicating light twinkles in every 5s, each period indicating light is on for 250ms, vehicle can't start. If authentication failed and vehicle can't start, please contact to maintenance technical personal to diagnose system. (Note: KL.15 is "ON", KL.30 is battery power supply, KL.31 is negative electronic)

II、Troubleshooting

(I) Troubleshooting list

No	Fault phenomenon	Fault reason analysis	Solution	Remark
1	Engine anti-theft indicating light is on	Combination meter	Maintain combination meter	
2	Engine anti-theft indicating light always twinkles, engine can't start	Transponder	Maintain transponder	Refer to "engine anti-theft indicating light always twinkles engine can't start"
		Anti-theft interaction coil	Maintain anti-theft interaction coil	
		Anti-theft controller	Maintain Anti-theft controller检修防	
		Engine ECU	Maintain engine ECU	
		Wiring harness connector	Maintain wiring harness connector	
3	Anti-theft system often can't detect effective key	Anti-theft interaction coil	Maintain anti-theft interaction coil	
		Anti-theft controller	Maintain anti-theft controller	
4	Key can't be matched	Transponder	Maintain transponder	
		Anti-theft interaction coil	Maintain anti-theft interaction coil	
		Anti-theft controller	Maintain anti-theft controller	

(II) Troubleshooting Flow Chart

Engine anti-theft indicating light always twinkles, engine can't start

Step	Check content	Measure	Judging specification	Next step	
				Yes	No
1	Check anti-theft controller power supply	Check fuse IF11, IF25	Check whether fuse IF11, IF25 is fused Fuse rated value: IF11, IF25 rated value is 10A	Next step	Turn to step 4
2	Check fuse IF11, IF25 circuit short circuit fault	Measure wiring harness resistance of fuse IF11, IF25 and vehicle body grounding	Resistance standard value: more than 10kΩ	Next step	Check and maintain circuit short circuit fault and replace rated current fuse
3	Test engine to start	Start engine	Whether engine starts normally	System is	Next step
4	Check anti-theft controller grounding	Measure resistance of anti-theft controller wiring harness connector M15-7 and vehicle body grounding	Resistance standard value: less than 1Ω	Turn to step 6	Next step
5	Check anti-theft controller grounding circuit	Check open circuit fault of anti-theft controller wiring harness M15-7 and vehicle body grounding	Whether engine starts normally	System is normal	Next step
6	Check electronic anti-theft interaction coil	Disconnect electronic anti-theft interaction coil wiring harness connector, and measure coil resistance by multimeter	Resistance standard value: 5~10Ω	Turn to step 8	Replace electronic anti-theft interaction coil
7	Test engine to start	Start engine	Whether engine starts normally	System is normal	Next step

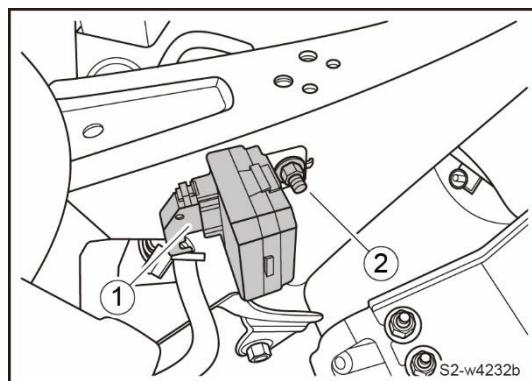
Step	Check content	Measure	Judging specification	Next step	
				Yes	No
8	Check circuit of electronic anti-theft interaction coil wiring harness connector and anti-theft system controller wiring harness connector	Measure resistance between electronic anti-theft interaction coil wiring harness connector M16-2 and anti-theft system controller wiring harness connector M15-6 by multimeter Measure resistance between electronic anti-theft interaction coil wiring harness connector M16-1 and anti-theft system controller wiring harness connector M15-1 by multimeter	Resistance standard value: less than 1Ω	Turn to step 10	Maintain circuit open circuit fault
9	Test engine to start	Start engine	Whether engine starts normally	System is normal	Next step
10	Check serial communication circuit between anti-theft controller and engine control module	Measure serial communication circuit resistance between electronic anti-theft interaction coil wiring harness connector M16-5 and ECU connector A22-46 by multimeter Measure serial communication circuit resistance between anti-theft controller wiring harness connector M15-4 and ECU connector A22-75 by multimeter	Resistance standard value: less than 1Ω	Next step	Maintain circuit open circuit fault
11	Test engine to start	Start engine	Whether engine starts normally	System is normal	Next step
12	Replace engine anti-theft system control module	Replace engine anti-theft system control module, carry out engine anti-theft system program	Whether engine starts normally	System is normal	Next step
13	Replace anti-theft controller	Replace anti-theft controller, carry out engine anti-theft system program	Whether engine starts normally	System is normal	Next step
14	Ensure system is normal				

III、Anti-theft Controller

(I) Removal

1. Open engine cabin cover
2. Disconnect negative electrode of battery Refer to “Disconnection and connection of battery cable”
3. Remove front extension plate Refer to “Auxiliary dashboard assembly”
4. Remove saucer cover plate assembly Refer to “Auxiliary dashboard assembly”
5. Remove front storage box assembly Refer to “Auxiliary dashboard assembly”
6. Remove auxiliary dashboard assembly Refer to “Auxiliary dashboard assembly”
7. Remove driver’s side air bag assembly Refer to “Driver’s side air bag assembly”
8. Remove steering wheel assembly Refer to “Steering wheel assembly”
9. Remove upper and lower jacketing of steering column Refer to “Jacketing of steering column”
10. Remove threshold guard plate assembly of front door Refer to “Threshold guard plate assembly of front door”
11. Remove lower trim plate assembly of A column Refer to “Lower trim plate assembly of A column”
12. Remove upper trim plate assembly of A column Refer to “Upper trim plate assembly of A column”
13. Remove end cover of dashboard Refer to “End cover of dashboard”
14. Remove central right trim plate assembly Refer to “Central right trim plate assembly”
15. Remove glove box assembly Refer to “Glove box assembly”
16. Remove A/C controller assembly Refer to “A/C controller assembly”
17. Remove audio panel assembly Refer to “Audio panel assembly”
18. Remove audio assembly Refer to “Audio assembly”
19. Remove central left trim plate assembly Refer to “Central left trim plate assembly”
20. Remove combination meter Refer to “Combination meter”
21. Remove lower guard plate assembly of driver’s side Refer to “lower guard plate assembly of driver’s side”
22. Remove central cover assembly Refer to “Central cover assembly”
23. Remove front passenger’s side air bag Refer to “front passenger’s side air bag”
24. Remove dashboard assembly Refer to “Dashboard assembly”
25. Remove anti-theft controller

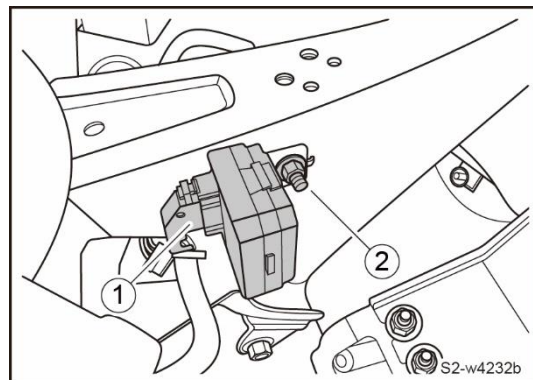
- 1). Disconnect anti-theft controller wiring harness connector ①;
- 2). Remove anti-theft controller fixed nut ②, and take down anti-theft controller;



(II) Installation

1. Install anti-theft controller

- 1). Install anti-theft controller to bracket and tighten nut ②;
- 2). Connect anti-theft controller wiring harness connector ①;

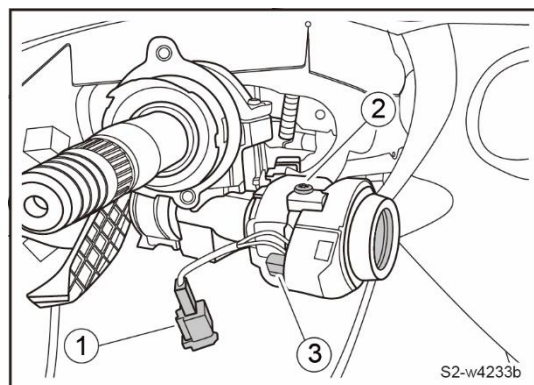


2. Install dashboard assembly
3. Install front passenger's side air bag
4. Install central cover assembly
5. Install lower guard plate assembly of driver's side
6. Install combination meter
7. Install central left trim plate assembly
8. Install audio assembly
9. Install audio panel assembly
10. Install A/C controller assembly
11. Install glove box assembly
12. Install central right trim plate assembly
13. Install end cover of dashboard
14. Install upper trim plate assembly of A column
15. Install lower trim plate assembly of A column
16. Install threshold guard plate assembly of front door
17. Install jacketing of steering column
18. Install steering wheel assembly
19. Install driver's side air bag assembly
20. Install auxiliary dashboard assembly
21. Install front storage box assembly
22. Install saucer cover plate assembly
23. Install front extension plate
24. Connect negative electrode of battery
25. Close engine hood cover

IV、Anti-theft Interaction Coil

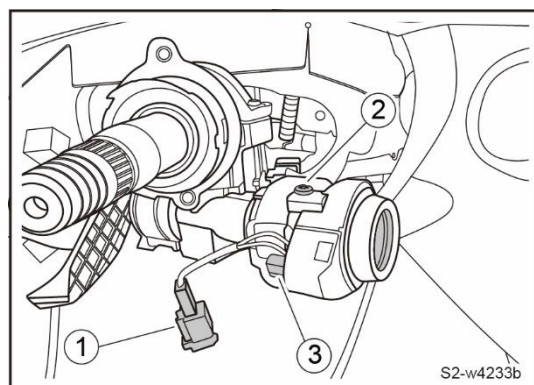
(I) Removal

1. Open engine cabin cover
2. Disconnect negative electrode of battery Refer to “Disconnection and connection of battery cable”
3. Remove driver’s side air bag assembly Refer to “Driver’s side air bag assembly”
4. Remove steering wheel assembly Refer to “Steering wheel assembly”
5. Remove upper and lower jacketing of steering column Refer to “Jacketing of steering column”
6. Remove clock spring Refer to “Clock spring”
7. Remove combination switch Refer to “Combination switch”
8. Remove anti-theft interaction coil
 - 1). Disconnect anti-theft interaction coil wiring harness connector ①;
 - 2). Remove fixed bolt ② of anti-theft interaction coil and ignition switch assembly;
 - 3). Pull out ignition switch backlight③, and take down anti-theft interaction coil;



(II) Installation

1. Install anti-theft interaction coil
 - 1). Install ignition switch backlight ③ to installation hole;
 - 2). Place anti-theft interaction coil to installation position, and tighten fixed bolt ②;
 - 3). Connect anti-theft interaction coil wiring harness connector



①;

2. Install combination switch
3. Install clock spring
4. Install upper and lower jacking of steering column
5. Install steering wheel assembly
6. Install driver’s side air bag assembly
7. Connecting battery negative electrode
8. Close engine cabin cover

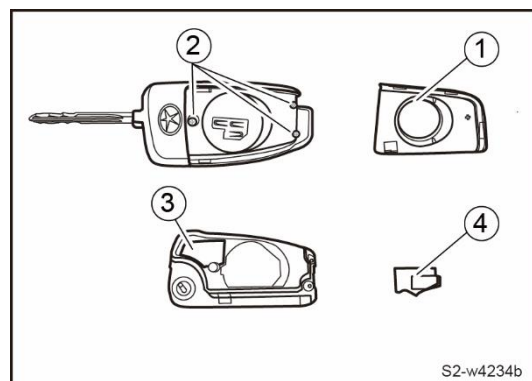
V、Transponder

(I) Removal

△ Note When removing transponder, be careful that spring drops down.

1. Remove transponder

- 1). Open remote control key rear cover ①;
- 2). Remove 3 fixed bolts ② in remote control key inner



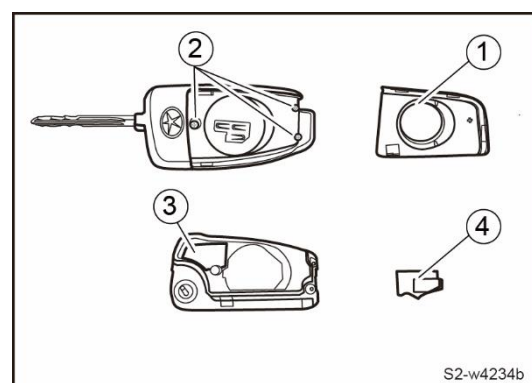
housing;

- 3). Remove remote control key inner housing ③;
- 4). Take out chip, transponder ④ from remote control key inner housing groove;

(II) Installation

1. Install transponder

- 1). Install transponder ④ and chip to remote control key inner housing groove ③;
- 2). Install remote control key inner housing to remote control key



base;

- 3). Tighten 3 fixed bolts ② in remote control key;
- 4). Install remote control key rear cover ①;

Tire Pressure Monitoring System

I、Summary

(I) Structure Summary

Tire pressure monitoring system is monitoring pressure and temperature inside tire, warning if exceed set value (indicator light on meter indicates warning state), and helping driver to know tire state actual time, reducing accident due to tire failure, and adding security of vehicle.

There are 3 units in TPMS system: warning indicating light (integrated in dashboard), TPMS controller, TPMS sensor; detail constitutions are shown as below

Component Name	Number	Remark
TPMS controller	1	Installed below auxiliary dashboard
TPMS sensor	4	Partly installed in four tires
Warning indicating light	2	Integrated in combination meter (2 indicating light) 1. Tire warning indicating light 2. TPMS warning indicating light

Warning Indicating Light Indicating

Symbol (meter)	Indicating light type	Indicating type
	Tire pressure abnormal	Fast air leakage : Twinkle Low pressure : Always on High pressure : Always on High temperature : Always on
TPMS	System fault	Sensor battery low power : Always on Sensor failure : Always on High frequency receiving failure : Always on Communication between controller and meter disconnected : Always on

Warning Type and Description

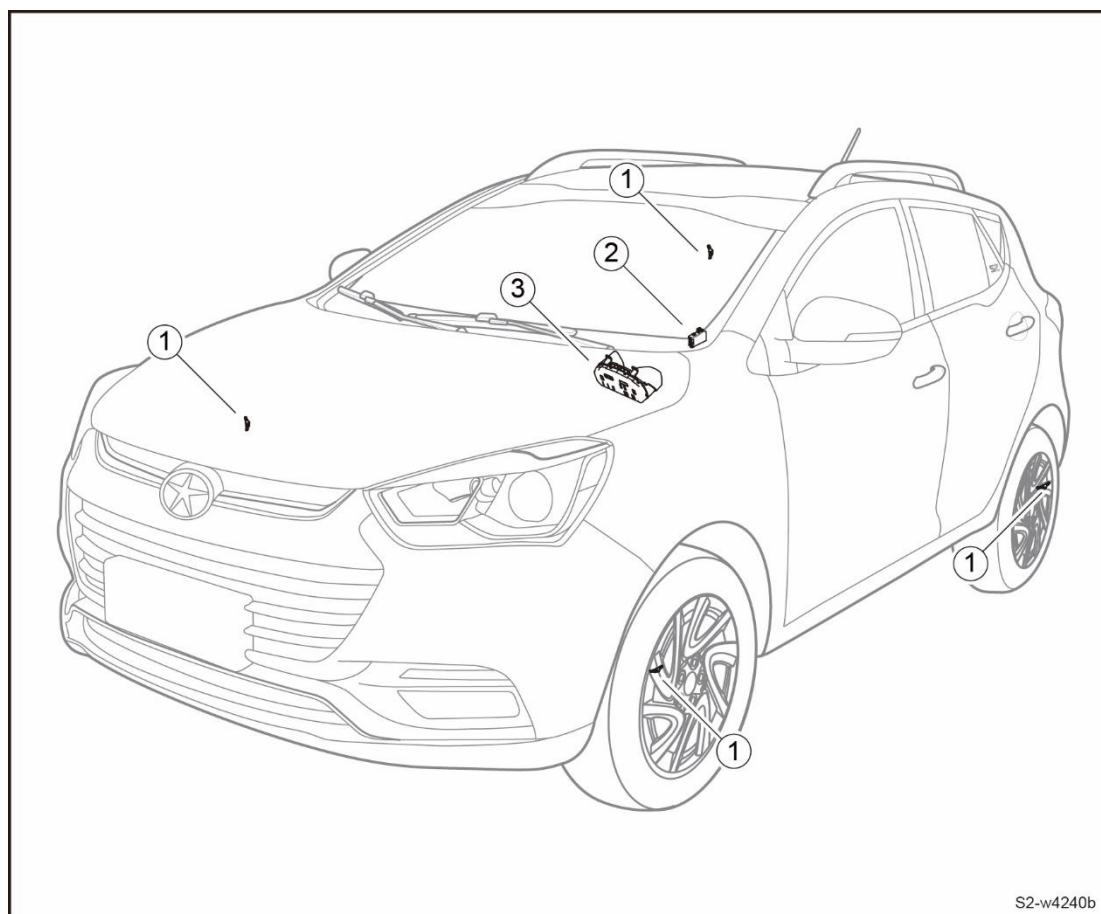
Warning Type	Description
Fast air leakage	When system running, one or some tires pressure drop over 30kPa in one minute, send fast air leakage warning; pressure stay same or up, remove fast air leakage warning
Low pressure	When system running, one or some tires pressure lower than 75% g (165kpa) of manufacturer specified cold air pressure value, send low pressure warning; pressure to normal, remove low pressure warning
High pressure	When system running, one or some tires pressure higher than 125% (275kpa) of manufacturer specified cold air pressure value, send high pressure warning; pressure to normal, remove high pressure warning
High temperature	When system running, one or some tires pressure higher than 85°C, send high temperature warning; temperature to normal, remove high temperature warning
Sensor battery low power	When system running, one or some tires sensor battery power lower than a certain value, send low battery power warning; battery power to normal, remove low battery power warning
Sensor failure	When system running, not receive one or two sensor effective data in 5-10 minutes(other sensor can receive effective data), send sensor failure warning; receive all sensor effective data, remove sensor failure warning

Warning Type	Description
High frequency receiving failure	When system running, controller not receive one or two sensor effective data in 20 minutes, send high frequency receiving failure warning; receive any sensor effective data, remove sensor failure warning

1. Ignition switch ON/ST, if has bindinged four sensor, indicator light and TPMS system failure light ON at the same time, and OFF after 2s.
2. Ignition switch ON/ST, if has not bindinged four sensor, indicator light ON and OFF after 2s, TPMS system failure light twinkle in the cycle of 2s.
3. Into sensor learning mode, two indicator light ON at the same time(light up), after binding successfully, two indicator light OFF at the same time.
4. When vehicle running, system and pressure is normal, two indicator light not ON.
5. Remove warning, warning indicator light OFF accordingly.
6. System is divided into 3 level according to warning condition priority(1st level is the highest);
 - 1st level: fast air leakage
 - 2nd level: low pressure, high pressure, high temperature
 - 3rd level: sensor battery power low, sensor failure, high frequency receive failure

When indicating warning status, preferredly light high level warning indicator light, and two indicator light not both ON at the same time.
7. After warning happened (accordingly indicator light ON), if ignition switch off and start again, system clear all warning status indicating, detect again.

Component Position

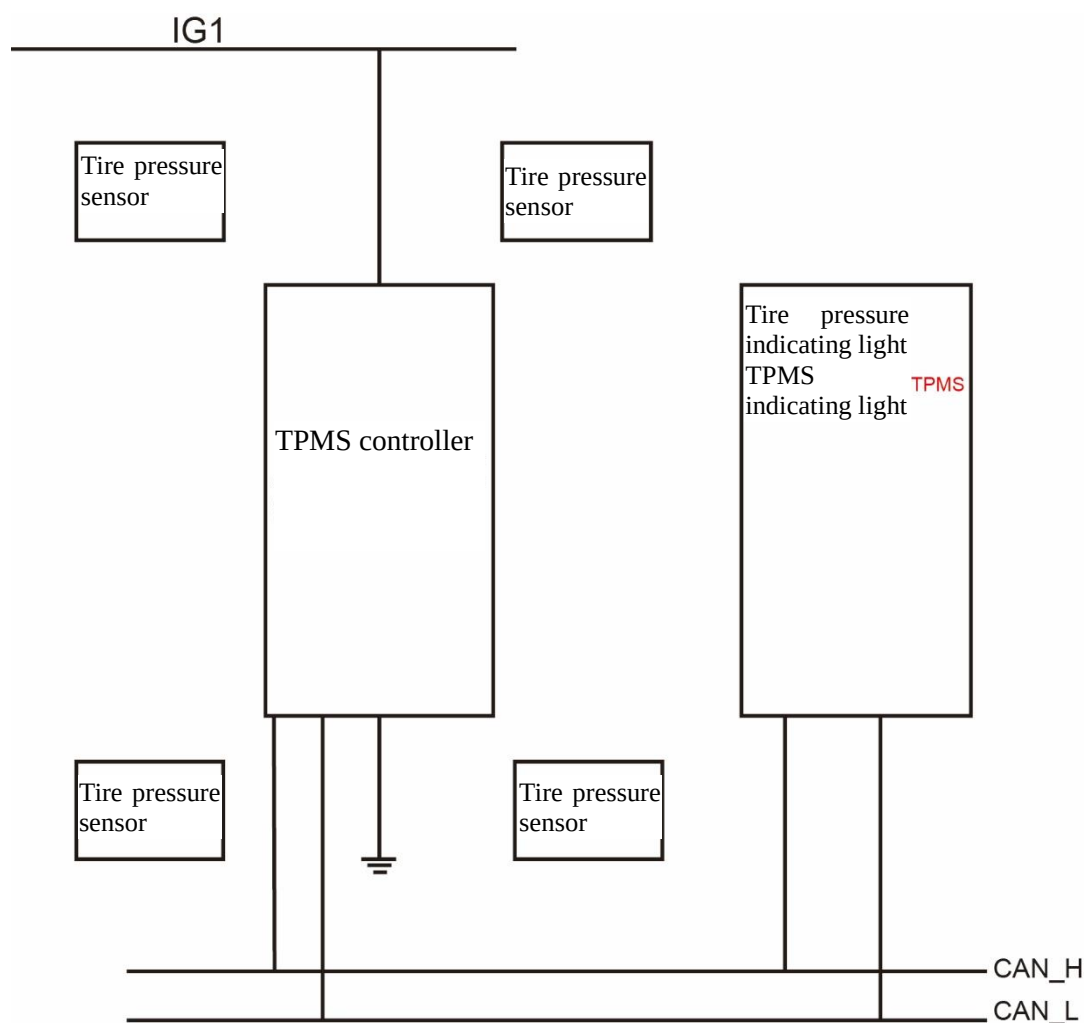


1. TPMS sensor

2. TPMS controller

3. Combination meter

(II) Operation Principle



(III) Maintenance Note

TPMS system is Tire Pressure Monitoring auxiliary System, the transmission of signal complete through high frequency signal. When high frequency signal is interfered by same frequency electromagnetic field, and at interfered status for long time, it will send system failure warning; when vehicle drive away from strong electromagnetic field, warning status will be removed automatically, it is normal.

When driving on bumpy road, vehicle turning, all tires stress differently, causing tire pressure too high or too low in the meantime, system sometimes will warning occasionally. When driving on flat and straight road, if pressure is normal, it will remove warning, it is normal.

When parking vehicle for a long time, tire pressure is normal and there is no obvious change, and doesn't receive any sensor data in continuous 20min, TPMS indicating light will be on; after vehicle driving, sensors start to transmit data, TPMS indicating light will be off, which is normal.

II、Troubleshooting

(I) Troubleshooting List

No.	Fault phenomenon	Fault reason analysis	Solution	Remark
1	Turn ignition switch to “ON”, tire pressure warning indicating light and TPMS indicating light are on at the same time for 2s, and not off	Original packing receptor on vehicle hasn't been learnt binding. Ever replaced receptor controller, and the receptor controller hasn't been learnt binding.	Use handheld learning tool, obtain all tire sensors ID again, binding receptor controller.	
2	Tire pressure warning indicating light twinkle	When driving, injury of prick holes and segmentation happen to tire, tire pressure fast drop When vehicle stop(ignition switch to ON/START), tire has decompression	Must stop vehicle as soon as possible and check all tire and pressure. After air pressure stop decompressing or inflated, it will remove warning automatically.	
3	Tire pressure warning indicator light always on	When vehicle stop(ignition switch to ON/START), tire has decompression, causing pressure too low. When vehicle stop(ignition switch to ON/START), tire pressure too high, causing pressure too high. When driving on bumpy road, vehicle turning, all tires stress differently, causing tire pressure too high or too low in the meantime. When driving, detected tire pressure not enough (tire not inflated for a long time or tire damaged causing air leakage). When vehicle driving high speed and overloaded, causing tire over heat. When driving, air pressure not enough, friction force increased, causing tire over heat.	Inflate tire to actual air pressure value. (There is tire pressure on tire pressure label) Inflate tire to actual air pressure value. Drive to flat and straight road, if pressure is normal, it will remove warning automatically. Must stop vehicle as soon as possible and check all tire and pressure. Reduce speed, reduce vehicle load. Must stop vehicle as soon as possible and check all tire and pressure.	
4	TPMS indicating light is always on	One or more tire pressure sensor battery power is lower than a certain value. In four tires, one or two tires not installed tire pressure sensor In four tires, one or two tires installed error (namely sensor ID and receiving controller ID not match) In four tires, one or two tires pressure sensor failure, can't transport data. High frequency module of receiving controller damaged, can't receive any sensor data in continuous 20 minutes.	Replace sensor, and learn binding again. Re-install sensor, and learn binding again. Replace tire position, and learn binding again. Replace sensor, and learn binding again. Detect receiving controller, if need replace receiving controller, must learn binding again.	Refer to “TPMS indicating light is always on”

No.	Fault phenomenon	Fault reason analysis	Solution	Remark
		Four tire sensors ID and receiving controller ID all not match, can't receive any effective sensor data in continuous 20 minutes.	Learn binding again.	
		When parking vehicle for a long time, tire pressure is normal and there is no obvious change, and doesn't receive any sensor data in continuous 20min.	It's normal phenomenon, after vehicle driving, sensors start to transmit data, warning state will be removed automatically	
		Drive in same frequency interfered area(interference strong and continuous), such as airport, radio transmit tower etc., may cover sensor signal.	After leaving same frequency interfered area, warning status will be removed automatically.	
		Receiving controller wiring harness bad connect	Detect receiving controller connector, and connect again.	
5	Turn ignition switch from OFF to ON, indicator light not on	Dashboard indicator light failure	Detect dashboard, if dashboard damaged, replace dashboard.	Refer to "When tire pressure is serious shortage, tire pressure warning indicating light is not on"

(II) Troubleshooting Flow Chart

TPMS Indicating Light is Always On

No.	Inspection content	Measure	Judging specification	Next step	
				Yes	No
1	Check battery voltage	Use multimeter to measure battery voltage	Standard voltage value: 11~14V	Next step	Check battery or charging system
2	Check TPMS control unit battery	Use multimeter measure voltage between TPMS control unit wiring harness connector F17-8 and body GND	Standard voltage value: 11~14V	Next step	Check fuse, maintain or replace wiring harness
3	Check TPMS control unit GND	Use multimeter measure resistance between F17-9 and body GND	Standard resistance value: less than 1Ω	Next step	Repair or replace wiring harness
4	Replace TPMS control unit	Disconnect battery negative pole cable, replace TPMS control unit, learn to binding tire pressure monitoring sensor again.	Whether system is normal	System is normal	Next step
5	Check power supply and GND circuit of combination meter	Check whether power supply and GND circuit of combination meter is normal	Standard voltage value: 11~14V Standard resistance value: less than 1Ω	Next step	Repair or replace wiring harness
6	Replace combination meter		Whether system is normal	System is normal	Next step
7	Replace tire pressure monitoring sensor	Replace tire pressure monitoring sensor, learn to binding tire pressure monitoring sensor again.	Whether system is normal	System is normal	

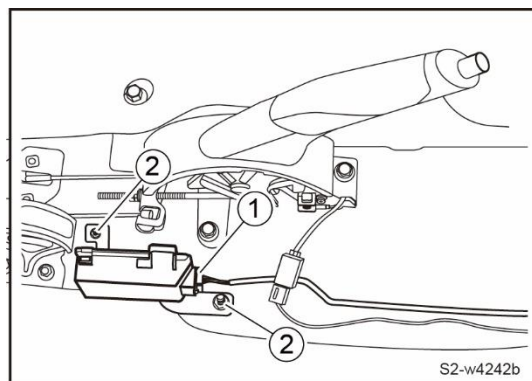
Tire pressure warning indicating light not on when wheel tire pressure is seriously insufficient

No.	Inspection content	Measure	Judging specification	Next step	
				Yes	No
1	Check battery voltage	Use multimeter to measure battery voltage	Standard voltage value: 11~14V	Next step	Check battery or charging system
2	Check wiring harness between combination meter and TPMS control module	Disconnect TPMS control module wiring harness connector F17 and combination meter wiring harness connector M07, and measure resistance between TPMS control module wiring harness connector F17-6 and combination meter wiring harness connector M07-1	Standard resistance value: less than 1Ω	Next step	Repair or replace wiring harness
3	Check TPMS control unit battery	Use multimeter measure voltage between TPMS control unit wiring harness connector F17-8 and body GND	Standard voltage value: 11~14V	Next step	Check fuse and repair or replace wiring harness
4	Check TPMS control unit GND	Use multimeter measure resistance between F17-9 and body GND	Standard resistance value: less than 1Ω	Next step	Repair or replace wiring harness
5	Replace TPMS control unit	Disconnect battery negative pole cable, replace TPMS control unit, learn to binding tire pressure monitoring sensor again.	Whether system is normal	System is normal	Next step
6	Check power supply and GND circuit of combination meter	Check whether power supply and GND circuit of combination meter is normal	Standard voltage value: 11~14V Standard resistance value: less than 1Ω	Next step	Repair or replace wiring harness
7	Replace combination meter		Whether system is normal	System is normal	Next step
8	Replace tire pressure monitoring sensor	Replace tire pressure monitoring sensor, learn to binding tire pressure monitoring sensor again.	Whether system is normal	System is normal	

III、TPMS Controller

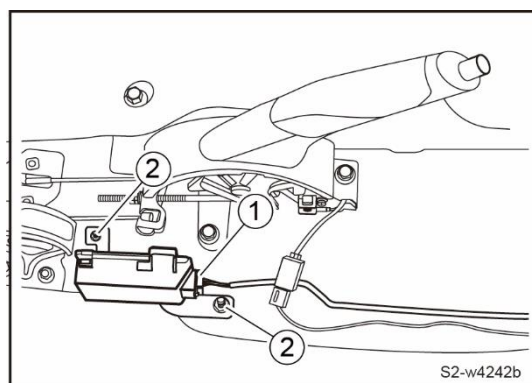
(I) Removal

1. Open engine hood cover
2. Disconnect negative electrode of battery Refer to “Disconnection and connection of battery electrode”
3. Remove front expansion plate assembly Refer to “Front expansion plate assembly”
4. Remove saucer cover plate assembly Refer to “Saucer cover plate assembly”
5. Remove front storage box assembly Refer to “Front storage box assembly”
6. Remove auxiliary dashboard assembly Refer to “Auxiliary dashboard assembly”
7. Remove TPMS controller
 - 1). Disconnect wiring harness connector ① of TPMS controller;
 - 2). Remove 2 fixed nuts ② of TPMS controller, and take down TPMS controller;



(II) Installation

1. Install TPMS controller
 - 1). Install fixed nuts ② of TPMS controller;
 - 2). Connect wiring harness connector ① of TPMS controller;

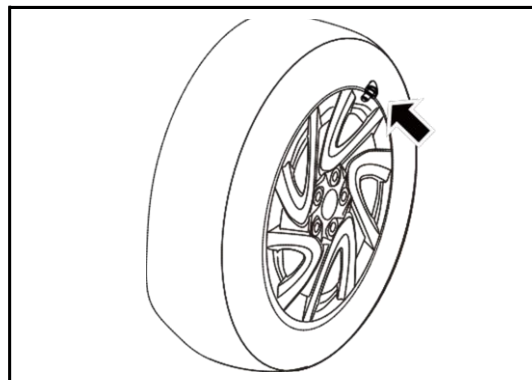


2. Install auxiliary dashboard assembly
3. Install front storage box assembly
4. Install saucer cover plate assembly
5. Install front expansion plate assembly
6. Connect battery negative electrode
7. Close engine hood cover

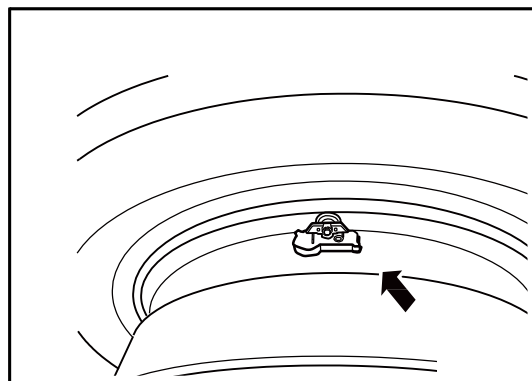
IV、TPMS Sensor

(I) Removal

1. Open engine hood cover
2. Disconnect negative electrode of battery Refer to “Disconnection and connection of battery electrode”
3. Remove vehicle wheel Refer to “Vehicle wheel”
4. Remove TPMS sensor
 - 1). Remove tire, and remove fixed nut of TPMS sensor from outside of wheel rim;

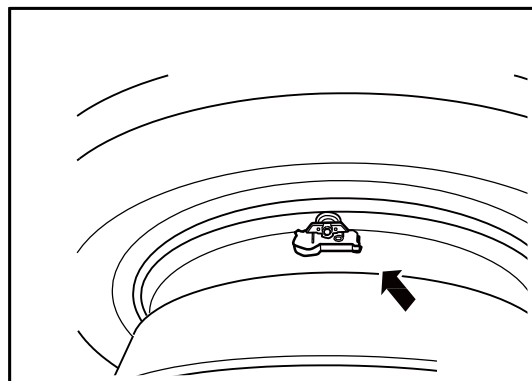


- 2). Take down TPMS sensor from inside of wheel rim;



(II) Installation

1. Install TPMS sensor
 - 1). Install TPMS sensor from inside of wheel rim;



2). Install tire, tighten fixed nut of TPMS sensor from outside of wheel rim;

△ Note Install seal rubber of sensor and wheel rim tightly, and ensure sealability of tire.

2. Install vehicle wheel
3. Connect battery negative electrode
4. Close engine hood cover

